

# **FIRE MANAGEMENT PLAN**

*for*

## **OZARK NATIONAL SCENIC RIVERWAYS**



**United States Department of the Interior**

**National Park Service**  
**Ozark National Scenic Riverways**  
**Van Buren, Missouri**

**FIRE MANAGEMENT PLAN**  
*for*  
**OZARK NATIONAL SCENIC RIVERWAYS**

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## **I. INTRODUCTION**

### **A. Requirements**

This plan outlines a detailed program of actions to be taken by Ozark National Scenic Riverways to

meet the fire management goals for the park. The Fire Management Plan (FMP) is tiered to the Ozark National Scenic Riverways (Ozark NSR) Resource Management Plan (RMP). The plan is also guided by Director's Order-18 (DO-18) which requires that all park units with vegetation capable of sustaining fire develop a Fire Management Plan.

## **B. Goals and Objectives to Achieve**

Resource management goals and objectives guide the Fire Management Plan – they determine whether fire may be used as a tool to manipulate vegetation and how it will be managed. In addition, where the park's General Management Plan (GMP) specifies suppression/protection needs, this document will assist fire program staff in meeting those protection goals.

The overarching goal of the FMP is the restoration and maintenance of fire-dependent ecosystems, with the primary focus on maintaining and expanding glade/ savanna complexes and improving woodland structure and species assemblages. Specific objectives define desired levels of reduction of woody stem densities and increases in abundance of native herbaceous species. These variables will serve as indicators for restoration and hazard fuel reduction.

In some cases, fire may also be used to restore, treat, or maintain cultural landscapes or other such cultural resources. However, the park currently lacks the baseline information necessary to develop specific goals and objectives with regard to fire as a management option for cultural resources. At such time as the information becomes available, and park management desires to apply fire as a cultural resource management tool, this document will be updated to reflect that need.

### **1. National Fire Plan Goals**

In addition to existing planning document objectives, there are four goals in the National Fire Plan that are addressed in park fire management plans.

**Goal 1. Improve Prevention and Suppression** – Improved cooperative efforts with state and local governments and other Federal agencies will result from direction in this plan.

**Goal 2. Reduce Hazardous Fuels** – Projects proposed in this plan, both mechanical and prescribed fire, will assist meeting this goal at Ozark NSR.

**Goal 3. Restore Fire-Adapted Communities** – Projects proposed for Goal 2 will be a starting point for the restoration of fire to the vegetative community of Ozark NSR.

**Goal 4. Promote Community Assistance** –A potential exists for local fire department support as well as technical assistance to communities, for risk reduction in the Wildland/ Urban interface (WUI.)

## **C. NEPA and Other Compliance**

An Environmental Assessment (EA) guides the FMP and complies with National Environmental Policy Act (NEPA) requirements and National Park Service (NPS) policy. The EA is an unattached appendix to the FMP, and analyzes environmental impacts of the operations detailed in this plan. A copy of the Finding of No Significant Impact is included in [Appendix D](#) and the full document is available at the Ozark NSR headquarters office.

The FMP will implement activities in accordance with the regulations and directions governing the protection of historic and cultural properties as outlined in the Department of Interior Manual, Part 519 (519 DM), and Code of Federal Regulations (36 CFR 800). The National Historic Preservation Act



of 1966 (NHPA), as amended, particularly Section 106, sets the requirements for the protection of the historic properties found in the park, requiring consultation with the State Historic Preservation Officer. Section 110 of NHPA further requires consultation with native tribes and other native peoples. A copy of the record of consultation is included in [Appendix D](#).

A Section 7 consultation with the U.S. Fish and Wildlife Service with regard to endangered species issues is also required and included in [Appendix D](#).

#### **D. Authority for Implementation**

The legal authority for the operation of the fire management program is found in 16 U.S.C. Chapters 1 and 3. The specific authorities can be found in 620 DM 1.1. The Organic Act of the National Park Service (August 25, 1916, Section 102) provides the authority for implementation of this plan.

The authority for FIREPRO National Fire Program funding (Normal Fire Year Programming) and all emergency fire accounts is found in the following authorities:

##### **1. Section 102**

Section 102, General Provisions of the Department of the Interior's annual Appropriations Bill provides the authority under which appropriated monies can be expended or transferred to fund expenditures arising from the emergency prevention and suppression of wildland fire.

##### **2. Public Law 101-121**

Public Law 101-121, Department of the Interior and Related Agencies Appropriation Act of 1990 established the funding mechanism for normal year expenditures of funds for fire management purposes.

##### **3. 31 USC 665 (E) (1) (B)**

Title 31, United States Code, Section 665 (E) (1) (B) provides the authority to exceed appropriations due to wildland fire management activities involving the safety of human life and protection of property.

## **II. NPS POLICY AND RELATION TO OTHER PLANS**

#### **A. NPS and 2001 Federal Fire Management Policy**

This FMP is prepared to meet the policy requirements of Director's Order 18 (DO-18), *Wildland Fire Management* dated November 17, 1998. The primary NPS policy consideration from DO 18 is: "Wildland fire may contribute to or hinder the achievement of park objectives. Therefore, park fire management programs will be designed to meet resource management objectives prescribed for various areas of the park and ensure that firefighter and public safety are not compromised." In addition, preparation of this plan meets the requirements set forth in Department of Interior Manual 620 (620 DM) and the requirements of the Federal Fire Policy update of 2001.

The goals of the NPS wildland fire management program are to:

- Conduct a vigorous and safe wildland fire management program with the highest professional and technological standards.
- Identify the type of wildland fire that is most appropriate to specific situations and areas.

- Efficiently accomplish resource management objectives through the application and management of prescribed and wildland fires.
- Continually evaluate the wildland fire program operations and accomplishments to better meet program goals by refining treatment and monitoring methods, and by integrating applicable technical and scientific advancements.

The 2001 Federal Fire Management Policy update addresses 17 distinct items, the foremost being safety; all Fire Management Plans and activities must reflect this commitment.

The four goals of the National Fire Plan are also addressed in this plan (see [Section I.B.1.](#))

## **B. Relation to Enabling Legislation**

### **1. Enabling legislation**

Public Law 88-492, (August 27, 1964) established Ozark NSR primarily to preserve natural and cultural resources and unique scenery, and provide for recreational enjoyment.

### **2. Purpose**

16 USC Sec. 460m states the purpose of establishment as:

"...conserving and interpreting unique scenic and other natural values and objects of historic interest, including preservation of portions of the Current and the Jacks Fork River in Missouri as free-flowing streams, preservation of springs and caves, management of wildlife, and provisions for use and enjoyment of the outdoor recreation resources thereof by the people of the United States..."

The House Interior Committee Report to Congress, which accompanied the enabling legislation, said that "In short" the Act establishes the importance of the park as a place

"for science, to be used as a yardstick in measuring the health of tame land."

### **3. Administration**

Ozark National Scenic Riverways is administered under the Organic Act of August 25, 1916, which established the National Park Service. This act states the purpose of the National Park Service is, "...to conserve the scenery and natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations".

## **C. Objectives of the General Management Plan**

The General Management Plan (GMP, NPS 1981) - the primary planning document for Ozark NSR - describes regional influences and management constraints which affect fire management activities. Its appendices contain the legislation, memoranda of understanding and existing agreements by which the park conducts and coordinates fire management with other agencies.

The GMP also contains a number of resource-specific objectives relevant to fire management.

### **1. For Wildlife Species**

To maintain the natural abundance, behavior, diversity, and ecological integrity of native animals in natural portions of the park and to rely primarily on natural processes to regulate populations.

## **2. Open Fields Management**

To maintain a pastoral scene and manage flora to provide a diversification favorable to game and non-game species.

## **3. Forest Management**

To promote natural reforestation of all of the natural zone, and implement existing agreements with the Missouri Department of Conservation in regard to fire suppression.

The GMP provides the following specific direction for fire management.

"Because aggressive fire suppression carried out over a number of years has caused an increase in ground fuels and other undesirable environmental changes, the National Park Service has considered the extent and the significance of such changes and the desirability of restoring the role of fire to the forest. Practices such as controlled burning and allowing naturally caused fires to run their course, providing that no threat to life or private property will occur and that the end result will be ecologically beneficial, will be considered."

### **D. Objectives of Natural And Cultural Resource Management**

This Fire Management Plan is tiered to the Resources Management Plan (RMP, NPS 1995) and will have as an appendix the Fire Monitoring Plan (Appendix F). These three planning documents operate in a hierarchical fashion to provide direction and resource management objectives for fire management, particularly prescribed fire.

The RMP, which is composed of a Natural Resources Management Plan (NRMP) and a Cultural Resources Management Plan (CRMP), contains language and goals that address the general role of fire as a tool of resource management. This Fire Management Plan provides greater specificity concerning actual program objectives. These objectives are based to the greatest extent possible on existing scientific data and are designed to ensure that fire management at Ozark NSR complies with the park's enabling legislation, National Fire Plan goals, and the mission of the National Park Service.

The NRMP states the goals for natural resource management are:

to maintain as far as possible a diverse natural environment, perpetuate native plant and animal species considered rare, and perpetuate natural biological communities (NRMP p.3,4).

Additional Resource Management objectives for Fire Management are:

- Continue interagency prescribed burns in the complex of units near Stegall Mt.

to ensure the continuation of benefits documented by Templeton and others (2001).

- Prescribed burn units should be spread throughout the park to the extent possible to

ensure that pockets of high quality habitat are available to support plant and animal populations throughout the park.

- Minimize soil erosion that may result from prescribed burning by retaining the duff layer. This should be accomplished by burning with duff moistures greater than

100%.

Fire management strategies will be coordinated with action plans for natural communities, wildlife, open fields and sensitive species, many of which are ecologically dependent upon fire. Many project statements in the NRMP are indirectly related to fire management. For example, *Conduct Studies of Short Leaf Pine*, calls for a literature review and ecology study of short leaf pine, a species strongly benefited by prescribed fire.

One of the most recent natural resource management documents available to park staff is the Fire Monitoring Plan. Prepared by resource management staff, the Fire Monitoring Plan reflects the most current resource management direction, with regard to fire. Specific objectives outlined in the plan include:

- In the Glade–Xeric Woodland Transition, reduce the density of trees > 1.4 m tall and < than 10 cm dbh by at least 40% ; and increase the average number of species (per quadrat) in the herbaceous layer by at least 40% within two growing seasons after the second burn .
- In the Dry Woodlands, reduce the density of trees > 1.4 m tall and < than 10 cm dbh by at least 30%; and increase the average number of species (per quadrat) in the herbaceous layer by at least 40% within two growing seasons after the second burn.
- In the Dry-Mesic Woodlands Reduce the density of trees > 1.4 m tall and < than 10 cm dbh by at least 30% ; and increase the average number of species (per quadrat) in the herbaceous layer by at least 20% within two growing seasons after the second burn
- Mix the season of burn to the extent that staffing and prescription windows allow. For example, try to burn no more than half of the units in one of the three burn seasons Fall (Oct.-Nov.), Winter (Dec.-Feb.) and Spring (Mar.-April).
- Burn most units two to three times during this ten-year period.

Currently, the CRMP goal is to protect archaeological and historic resources, until inventories can be completed. These inventories - such as archaeological survey, ethnographic research, and cultural landscape identification - will provide the baseline information necessary to define the role of fire in cultural resource management. For the time being, protection of the resources will involve compliance with Section 106 of the National Historic Preservation Act, and suppression of fires threatening historic structures.

#### **E. Achieving General Management Plan and Resource Management Plan Objectives through the Fire Management Plan**

In outlining specific actions to use prescribed fire, the Fire Management Plan will address the required mitigation, programming and monitoring, and research needs. These actions will assist in meeting needs outlined in both the General Management Plan and the Resources Management Plan by restoring fire to the ecosystem, providing improved habitat for wildlife and reducing fuels to prevent unwanted wildfires from damaging the park's natural and cultural resources.

Natural resource concerns are the basis for much of the fire program. There are several natural resource objectives and strategies that the fire program - particularly prescribed burning - is intended to implement. The objectives and strategies include ensuring that basic ecosystem functions such as hydrology, energy capture and nutrient cycling occur at levels that sustain appropriate demographic levels of native species. Expertise in the resource management and fire programs will be combined in the following six steps to ensure a successful prescribed fire program.

1. Identify a desired condition of plant and animal habitat quality, if not in specific detail, then at least in terms of

*direction from the current condition.*

2. *Identify adjustments to the current condition achievable through fire effects.*
3. *Prescribe the appropriate fire extent, frequency, intensity and severity necessary to*

*achieve those fire effects.*

4. *Schedule the prescribed fire spatial and temporal arrangements for appropriate fire extent and frequency; and write prescriptions that can produce the fire behavior necessary to achieve the desired intensity and severity.*

5. *Execute the prescribed burn schedule and prescribed burns as planned, so as to tie the prescription to fire behavior and effects.*

6. *Monitor ecosystem condition and changes; and fire effects, behavior, and execution.*

**Fire management also addresses the overall NRMP objectives by providing opportunities to control the encroachment of woody vegetation and exotics, and accumulation of plant litter, which are related to the loss of native species associated with natural communities (Ver Hoef et al. 1992). Ladd (1988) states Missouri woodlands protected from fire "...are undergoing compositional and demographic changes at a rate that could not have been continuously sustained since European settlement... accompanied by a decline in overall species richness." Exotic species will be discouraged, except where appropriate for historic or cultural landscapes, because they reduce available habitat for native species and interfere with natural biological communities, and natural processes.**

#### **1. Ten-Year Project Schedule – Long Term Prescribed Fire and Hazard Reduction Plan**

**During the summer of 2002, Ozark NSR fire staff completed a ten-year schedule for prescribed fire projects (Appendix I). The schedule was created through consultation with members of Ozark NSR Resource Management and staff members from cooperating agencies. Input from these groups was taken from a series of meetings and correspondence in the spring of 2002. The current plan features the inclusion of previously burned units that predate the fire effects monitoring era, multiple burns in each unit, and several new units.**

**The schedule is intended to serve as a guiding document for fuel treatments using prescribed fire at Ozark NSR for the years 2003-2012, and reflects the park's vision of using prescribed fire to achieve community restoration goals over the next ten years. As such, the plan emphasizes the creation of landscape-scale blocks composed of multiple burn units with similar fire regimes. Cooperative burns with interagency partners are also emphasized, which furthers the ability to effect landscape scale restoration.**

**This schedule will be reviewed annually to assess project funding, viability and to initiate planning with other agencies, as required.**

#### **F. FMP Program Statement**

**The FMP is a detailed description of the actions necessary to carry out fire management policies and achieve both GMP and RMP objectives. Legal mandates related to the park's establishment are also supported by the FMP.**

### **III. SCOPE of wildland fire management Program**

#### **A. Ozark NSR Fire Management Goals**

Ozark NSR fire program goals are: safely and efficiently suppress all unwanted wildland fires; protect people and their property; protect natural and cultural resources; safely and efficiently use prescribed fire to restore natural communities; provide habitat conducive to sensitive species, game, and non-game species; maintain scenery; reduce exotics; and reduce fuel loads. Specific goals follow:

- Protect life, property and resources from the effects of wildland fire, giving primary consideration to firefighter and public safety.
- Educate employees and the public about the scope and effect of wildland fire management, including fuels management, resource protection, wildland fire prevention, hazard/risk assessment, mitigation and rehabilitation, and fire's role in ecosystem management.
- Maintain the highest standards of professional and technical expertise in planning and safely implementing an effective wildland fire management program, including suppression operations, prescribed fire application and fire effects monitoring.
- Integrate fire management with all other aspects of Ozark NSR management.
- Use prescribed fire to meet resource management objectives.
- Manage wildland fire incidents in accordance with accepted interagency standards, using appropriate management strategies and tactics and maximize efficiencies realized through improved interagency coordination and cooperation.

#### **B. Wildland Fire Management Elements**

##### **1. Wildland Fire**

a. Suppression – All wildland fire regardless of cause will be suppressed using appropriate management response, without any compromise of firefighter and public safety. It is anticipated that the Missouri Department of Conservation (MDC) will continue to cooperate in this effort.

Suppression operations are complicated by the linear Park shape and numerous inholdings, which greatly increase the likelihood of fires escaping park lands and affecting adjacent landowners and inholdings. Historically, most ignitions were probably external to the Ozark NSR 269-mile exterior boundary. Heavy visitation now places a portion of ignition risk internal to the boundary.

b. Wildland Fire Use – While the General Management Plan endorses the concept of Wildland Fire Use in each of the FMUs, appropriate management response will be the preferred wildland fire management strategy. Wildland Fire Use, while a desirable method of applying fire to the landscape, is not feasible due to the linear nature of the park, the number of scattered inholdings, other non-Federal property and the limited number of natural ignitions in the park. There will be no Wildland Fire Use in Ozark NSR.

##### **2. Fuels Management**

a. The emphasis of the prescribed fire program will be on burning natural ecosystems. Emphasis will be placed on burning larger areas (landscape management) where possible. Prescribed fire will continue to emphasize hazard fuel reduction and restoration of fire as an important force in shaping the structure of the biotic community.

There are three categories of open fields that may have prescribed fire applied. The first are those fields treated as agricultural resources. These fields are under permit to farmers and there is a park commitment to burn these fields to maintain vigorous growth.

The second category involves maintaining historic landscapes. Open fields determined significant to cultural landscapes may have prescribed fire applied, to prevent succession from altering the landscape's character.

The third category of field is managed for wildlife benefit. Prescribed fire application on these fields will have a lower priority than on the agricultural fields. Field inventory and monitoring will continue for these burns to re-evaluate the effectiveness of this program. When appropriate, prescribed fire will be used to provide training opportunities for personnel assigned position task books.

Ozarks NSR is presently funded to support a Fire Ecologist position, who is to provide fire effects monitoring services to all National Park Service sites in Arkansas, in addition to Ozark NSR . Fire monitoring will be used to determine if prescribed fire objectives are being met, validate fire prescriptions and evaluate the effects and impacts of fire on natural communities and biological diversity.

Reasonable available control measures will be used to mitigate the effects of smoke from prescribed fires. Smoke reduction will be addressed in all prescriptions and smoke modeling software (SASEM, CONSUME, FOFEM, etc) applied where practical.

b. Non-fire Hazard Fuel Reduction – Some mechanical hazard fuel reduction will be done, primarily in glade areas where cedar encroachment is a problem. In the Historic and Developed FMUs, projects to reduce fuel loads around the edges of the FMUs will be undertaken.

Within the Historic and Developed FMUs, normal grounds maintenance (mowing, raking, etc.) will also reduce risk of unwanted wildland fire but will not be project oriented. In addition, Wildland Urban Interface projects may be developed with cooperators and adjacent land owners.

### C. Descriptions of Fire Management Units (FMUs)

Ozark National Scenic Riverways' General Management Plan has identified four management zones: Natural, Historic, Developed and Special Use. The four management zones also serve as the park Fire Management Units. Maps of the park's management zones can be found in the General Management Plan.

Ozark NSR contains 80,800 acres, of which 2,047 acres are water surface. Table 1 contains the March 1, 2002 distribution of ownership.

Table 1 – Ozark NSR Acreage Distribution

Federal Acres	61,336.42
Non-Federal Acres	

Other Public (state) Acres	14,062.59
Private Acres	5,401.03
Total Ozark NSR Acres	80,800.04

There are 81 privately owned tracts containing 324 structures valued at \$2,943,197. Two hundred forty public structures are valued at \$5,805,843 (see [Section III.C.3.a](#) for table). Fifteen historic sites contain 61 historic structures (see [Section III.C.2.a](#) for table), and fifty-four (54) archeological areas contain 336 sites. Forty-five sensitive biological communities have been identified covering 2,096 acres

## **1. Natural FMU**

**a. Characteristics** – Ozark NSR is located in the Ozark highlands of southeastern Missouri, in a scenic and relatively undeveloped area of narrow, steep-sided valleys and clear running streams flanked by impressive bluffs. Despite the undeveloped nature of the region, most of the area within the boundaries is accessible by 4-wheel drive vehicles.

Topographically, the park exhibits a universally hilly profile, with pronounced hollows and ridges so numerous and convoluted that a fire of any size would involve many aspects and slopes. Elevations of Current River range from 925 feet above mean sea level (MSL) at Montauk in the north to 400 feet MSL at the park's southern boundary. Most local relief ranges from 300 to 500 feet above the river.

Geologically, Ozark NSR contains some of the most ancient rocks on the North American continent. Millennia of erosion and uplift have produced entrenched meanders carved into classic Karst topography, with sinkholes, aqueous conduits, and numerous springs and caves. Most soils in the park are derived from the weathering of cherty limestone and dolomite and, to a lesser degree, shale and sandstone.

The intricate hydrological system of Ozark NSR has been the subject of considerable research and monitoring, and the park maintains a large bibliography on the aquatic resources. Since the Jacks Fork and Current Rivers have been identified by the state as "Outstanding Natural Resource Waters" in state water quality standards, run-off and water quality are considerations of fire management activities. Detailed descriptions of park geology are available from Vineyard (1969).

Ozark NSR has numerous cultural and archeological resources and sites. Most are closely associated with the river bottoms, although sites are well distributed within the park.

The U.S. Fish and Wildlife Service (USFWS) has identified four Federally listed threatened or endangered species known to inhabit Ozark NSR: Gray bat (*Myotis grisescens*), Indiana bat (*Myotis sodalis*), bald eagle (*Haliaeetus leucocephalus*), Swainson's warbler (*Limnothlypis swainsonii*). The Ozark hellbender (*Cryptobranchus alleganiensis bishopi*), is a candidate for listing. NPS requires that candidate species are treated the same as listed species. Table 9 in Appendix C lists the threatened and endangered species listed by the USFWS as present or suspected in Missouri.

Ozark NSR contains approximately 15% of all the sensitive species sites recorded in



Missouri, (Nigh, pers. com, 1991). Sensitive areas which will require special consideration in the Fire Management Plan include all of the Outstanding Natural Features identified in the Ozark NSR General Management Plan. The locations of these and additional sites of important terrestrial biological resources in the park are listed in a report by Nigh (1988), and the State Heritage Database.

Vegetative communities of Ozark NSR include deciduous and coniferous forest associations, glades, savannas, bluff and rock ledges, gravel bars, and aquatic communities. The natural communities of the park support a large number of relict and Ozark endemic species. Vegetative communities on the park have been described by Redfearn et al. (1969), and Reiter (1991). Redfearn et al. (1969) outlined successional stages based on geologic parent material and moisture gradient, and set up sampling sites and stations to characterize the species composition of plant communities.

Air quality in the southeast Missouri Ozarks is quite good, except for a few point sources such as charcoal plants. Prescribed fire is a common land management tool in the region, and is used by the U.S.F.S. Mark Twain National Forest, The Nature Conservancy, and the Missouri Department of Conservation. Occasionally, air quality suffers when the smoke load from numerous prescribed fires exceeds the natural ability of the atmosphere to dilute and transport pollutants.

NPS real property is scattered through the park and includes campgrounds, developed areas, boat landings, historic and modern buildings. Inholdings are also dispersed through the park and are at risk from wildland fires and escaped prescribed fires.

**a. Fire Management Goals**

- Contain 95% of all initial attack fires during the first burning period.
- Use prescribed fire to reduce fuels on the portion of the park adjacent to inholdings to reduce the risk of fires to those properties.
- Continue to use fire to manage open fields as appropriate and in conjunction with the open fields management plan.
- Increase habitat and species diversity by restoring glade/savanna complexes
- Improve forest and woodland structure
- Monitor fire behavior and fire effects on 100% of prescribed fires to provide information for future evaluation and program direction.

**c. Management Considerations**

- Firefighter caution in areas of acquired property with abandoned power lines and associated transformers (potential pollution hazard and safety issue).
- Avoid adverse effects on caves containing bat populations.
- Maintain Class II air quality.
- Bulldozers and other tracked vehicles will not be used without approval of the superintendent.
- Prevent escape of prescribed fire to Missouri Ozark Forest Ecosystem Project lands and to non-NPS lands in general.
- Avoid adverse effects on T&E species.
- Protect historic and park structures from fire.

**d. Historic Role of Fire**

Fire has been an important force shaping plant and animal communities in the Ozark Highlands for thousands of years. Accounts of early travelers and settlers, data from original land surveys, and dendrochronology all provide evidence of a landscape profoundly influenced by fire (Batek *et al.* 1999, Guyette 1995, Ladd 1991, Schoolcraft 1821). Lightning-ignited fires are relatively infrequent in the region, and there is little

doubt that since the arrival of Native Americans in the Ozarks approximately 10,000 years ago, the predominant source of ignition has been anthropogenic. Native American populations throughout the Ozarks used fire locally to improve and prepare land for hunting, settlement, and agriculture (Guyette and Cutter 1997, Ladd 1991). Human-ignited fires spreading from the prairies and oak savannas of western and central Missouri also influenced landscape patterns of vegetation in the Current River Watershed (Batek *et al.* 1999, Guyette 1995).

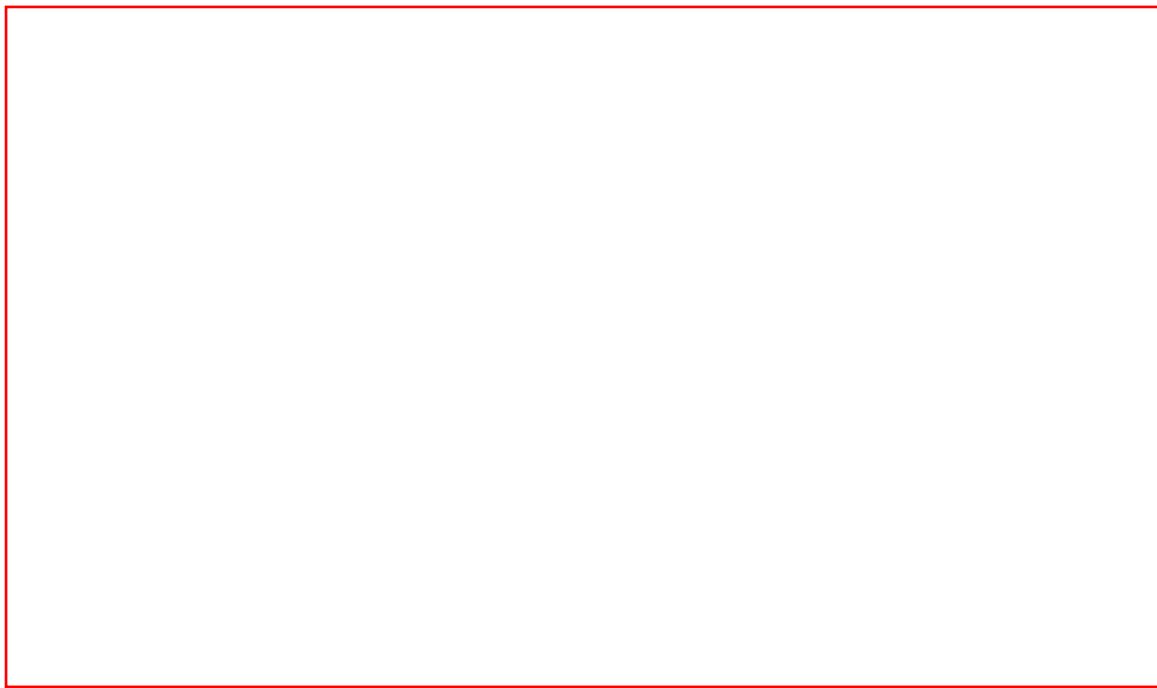
The role of fire in the natural communities of Ozark NSR has been largely dependent upon human populations, thus fire regimes have varied with shifting populations through time. The overall presettlement fire regime for the region that includes Ozark NSR has been classified as one of understory fire with a short fire-return interval (0-10 years) (Menakis 2000). This frequent, low-intensity fire regime maintained a variable mosaic of open oak-hickory-pine forests and woodlands along with numerous glade/savanna openings in the uplands. In riparian settings, large tracts of river cane (*Arundinaria gigantea*) and mesic-oak savannas resulted from settlement practices that included fire.

#### e. Wildland Fire Management

(1). Historical Weather – The climate of Ozark NSR is mild, with hot humid summers and cool winters. About half the days in July and August have daytime maximal temperatures 90+ degrees F. with temperatures often above 100 degrees F. The growing season averages 180 to 200 days. Winter temperatures below zero occur about one winter in two and winter periods with daytime temperatures in the 50's and 60's occur most weeks. Snow is infrequent, generally melts within a few days, and rarely exceeds eight inches annually. Maximum depth of frost penetration is about three inches. Precipitation is distributed irregularly and usually ranges from 40 to 50 inches per year. Locally severe thunderstorms can occur during any month, and tornadoes are reported infrequently. January and October are typically the driest months, and March and May the wettest. Average high and low temperatures and average rainfall information from Poplar Bluff, MO, 40 miles east of Ozark NSR is shown in the chart below.

Along with certain weather conditions specific to spring, traditional leaf burning by residents in "spring cleanup", make the spring season the most critical fire period in Missouri's woods. The strong low pressure areas which develop over the central U.S. in spring produce extended periods of high winds with low humidities. Wind speeds taken at West Plains and Salem, Missouri, show March and April to have the greatest number of days with wind speeds in the 15-25 mph. range. Greater spring cloudiness in March and April reduces the intensity of solar radiation compared to August and September, but more of it reaches the surface litter because of the lack of foliage. Severe late summer droughts can cause the fall season to begin earlier and be a more critical period of fire activity.

The spring transition stage from cured to green foliage occurs more rapidly than the fall curing. Summer decomposition reduces surface litter to an annual minimum by the end of September. Mature vegetation cures rapidly after the first killing frost, and by early November, much of the year's leaf and pine needle production, estimated at 2 tons/acre, has dropped to the ground. The winter months of December and January have the highest number of days over 70% relative humidity, and the duff in surface fuels tends to hold moisture well during this period.



Bluff, MO

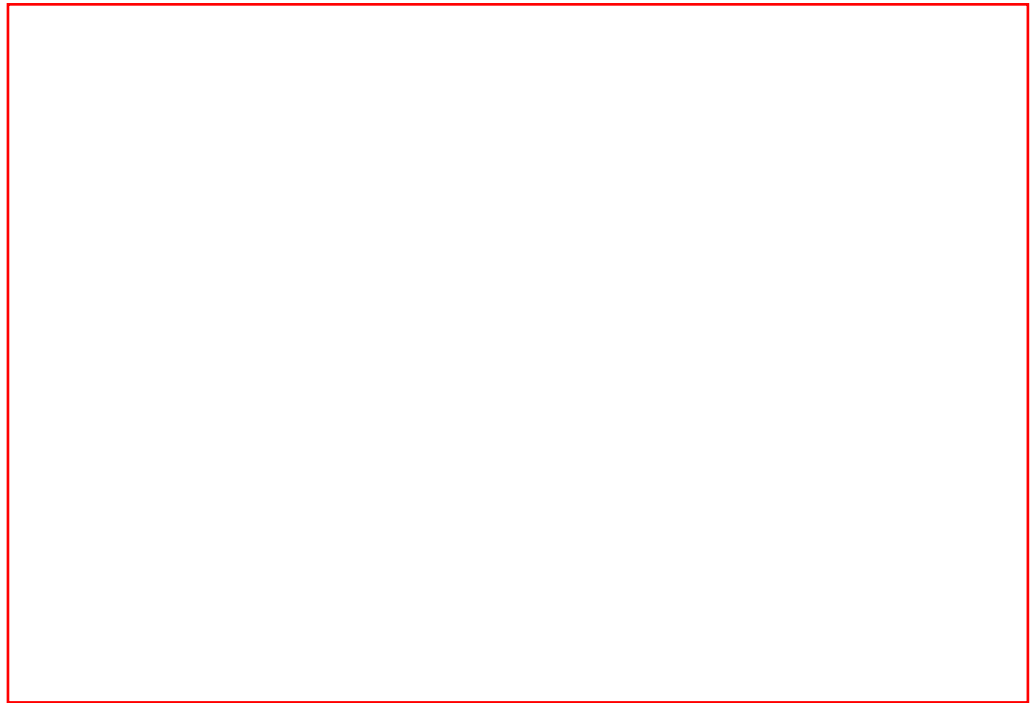
Figure 1 – Climatology, Poplar

The spring transition stage from cured to green foliage occurs more rapidly than the fall curing. Summer decomposition reduces surface litter to an annual minimum by the end of September. Mature vegetation cures rapidly after the first killing frost, and by early November, much of the year's leaf and pine needle production, estimated at 2 tons/acre, has dropped to the ground. The winter months of December and January have the highest number of days over 70% relative humidity, and the duff in surface fuels tends to hold moisture well during this period.

The National Weather Service in Paducah, KY issues spot and zone weather forecasts. Fire weather stations at Eminence, and Piedmont are maintained by MDC; while the U.S. Forest Service maintains stations at Doniphan, Ava, and Salem. The park has automated fire weather stations at Big Spring and Van Buren. Prior to automation, Ozark NSR weather data collection was inconsistent at best. When sufficient data has been collected from the automated station, analysis will provide more accurate and reliable information for making fire management decisions. A distinct advantage of an automated station is the availability of observations 24 hours a day as opposed to the once a day, 1:00 p.m. observation, from a manual station.

(2). Fire Season – Traditional fire seasons in the area occur in the spring and fall, but based on park occurrence records, the official fire season for Ozark NSR is from February 1 to April 25. In addition a second fire season frequently occurs from October 15 to November 15, depending on seasonal moisture. The Mark Twain National Forest, adjacent to the park, designates the fire season as February 1 through June 1 while the National Weather Service uses October 10 to May 24 as the official fire season for southern Missouri. Generally, Ozark NSR has few fires during the summer. Wildland fires have occurred during every month of the year, primarily due to arson. Figure 2 below shows the annual average number of fires, both prescribed and wildland

**Figure 2 – Average Monthly Fire Count**



Prescribed fire operations can be conducted during any month but the traditional season at Ozark NSR is during March and April. As fire effects monitoring information becomes available, seasonality of prescribed fire application may change to better achieve desired results. In addition, a change in season of some prescribed fire would reduce the potential for air quality problems when Ozark NSR, the Forest Service, the Department of Conservation and private landowners are all conducting prescribed fires in the same window of opportunity. Specifically, autumn will be considered as a possible prescribed burn season. Figure 3 below shows the average acreage burned, both by prescribed fire and wildland fires.

(3). Fuel Characteristics – Vegetation types of major concern to fire management are the oak-pine forests, savannas, old fields, and cedar glades. For predicting fire danger potential, these cover types are represented by NFDRS (National Fire Danger Rating System) Fuel Models E (hardwoods winter), R (hardwoods summer), L (western perennial grass), and F (intermittent brush).

Critical fire behavior variables, such as flame length, rate of spread, and fireline intensity may be estimated using the BEHAVE computer software and Northern Forest Fire Laboratory (NFFL) fuel model 9 as this is the predominant fuel.

NFFL model 9 fires generally consume leaf litter and branchwood. They may top-kill small trees up to five inches in diameter. During extreme weather most of the overstory trees can also be killed, particularly with the large accumulation of 100 hour fuels that have developed from extensive sprouting after logging and years of fire protection. In the summer, hardwoods fire effects are generally less severe, except many top-killed trees do not sprout as well after summer fires. Under normal conditions flame lengths of four to five feet are common on very steep slopes; but under extreme conditions crown fires occur even on much flatter terrain, with spotting as far as 100 yards and temporary rates of spread exceeding a chain per minute.

In the cedar glades, conditions tend to be dry year round and fire behavior would be driven by fuel moisture and to a lesser degree by wind.

**Figure 3 – Average Acres Burned Monthly**



(4). **Fire Regime Alteration** – The fire regime of the Ozarks has been altered several times and in various ways since settlement. Clearing for agriculture removed forest cover and provided row crops or grass in its place. As agriculture became more marginal, some areas reverted back to forest, but likely not the original type of forest, because of fire suppression. Logging for forest products also changed the composition of the cover, allowing increased amounts of brush mixed in with the forest cover.

After the arrival of European settlers around 1820, there was a significant change in the pattern of fire use in the Current River watershed. Though pioneers, like Native Americans, used fire to improve agriculture, they also burned intensively to increase forage for livestock. These fires were more frequent, smaller, and generally less severe than those of presettlement times; and they were more widespread, burning in areas that heretofore may not have burned frequently (Guyette 1995). The net result of this change is that while Native American burning patterns tended to increase habitat diversity, burning by European settlers tended to result in a more uniform landscape.

Between 1850 and 1940, increasing populations of European settlers and the changes wrought by their settlement patterns led to a decline in fire frequency. In the end of the 19<sup>th</sup> century and beginning of the 20<sup>th</sup> century, the entire area was heavily logged, resulting in a fundamental change in the fuel matrix and massive losses of organic materials and soil. Other factors identified in the reduction of fire frequency include grazing, road construction, and fire suppression related to timber values. By the 1940s, the national policy of full fire suppression arrived in the Ozarks. Fire suppression activities were quite effective, resulting in a steady decline in the number of sites burned. According to Guyette (1995), 21% of sites in the Current River watershed

burned in 1940, whereas in 1990 less than 1% of those sites had burned.

Suppression actions initiated by the State of Missouri in the early 1940's were extremely intense. Coupled with legal means to prosecute those allowing fires to escape their premises, suppression became quite effective with the resultant decrease in widespread wildland fires. These actions have resulted in the increase in wildland fuel loads.

In the absence of fire, the structure and composition of Ozark NSR upland forests and grasslands has become altered by increased density of woody species, and resultant decreases in herbaceous cover and frequency. Formerly open forests and woodlands of oak, hickory, and pine have experienced a reduction in the importance and regeneration of short-leaf pine (*Pinus echinata*) and an increase in fire-sensitive species such as dogwood (*Cornus florida*), maple (*Acer rubrum* and *A. saccharum*) and black gum (*Nyssa sylvatica*). Many of the glade/savanna complexes at Ozark NSR have undergone considerable change in structure and function since the advent of full fire suppression. These imperiled communities, among the most biologically diverse in the region, have become overgrown with woody species such as eastern red-cedar (*Juniperus virginiana*) and a variety of hardwoods (Ver Hoef *et al.* 1992).

The Current and Jacks Fork Rivers and adjacent riparian and upland landscape became Ozark National Scenic Riverways in 1964. Though some management-ignited burns were conducted prior to the 1990's, the policy of full fire suppression dominated fire management in the park since its inception. While all wildland fires are still actively suppressed, the park's current program of using prescribed fire to effect landscape-scale hazard fuel reduction and upland restoration was initiated in 1994, with the publication of the park's original Fire Management Plan (NPS OZAR 1994). The focus of the fire program continues to be increasing habitat and species diversity by restoring glade/savanna complexes and improving forest and woodland structure.

Since the early 1970s, some management of traditional open fields by means of prescribed fire has occurred. The acreage burned and type and location of fuels involved are not, however, sufficient to reduce risk in most fields.

Park fire records from 1982 through 2001 show that most fires are less than 100 acres (fire size classes A to C); and most wildland fires were human-caused. Days with multiple fires are common within Ozark NSR and surrounding public properties. Incendiary fire occurrence is difficult to predict and multiple fires require greater response capability and more hours for control. Wildland fire records show February, March, April and November the months with the highest wildland fire occurrence.

Ozark National Scenic Riverways had contracted with the Missouri Department of Conservation (MDC) for suppression within the park until 1987. Many fires within the park were not reported on DI-1202 forms, and the number of reported in-park fires prior to 1987 in the Fire Occurrence System is low. As the FirePro Analysis only considers the previous 10 years to establish fire season, staffing needs and risk factors, the lack of data prior to 1987 is important only from a fire history viewpoint.

Ozark NSR is located primarily in the state's Eminence Fire Protection District, a jurisdiction of 1,343,265 acres, including more than 2/3 of Shannon County, Missouri's most forested county, and 59,426 acres of the park. While park boundaries touch or extend into three other State Fire Districts, the bulk of NPS lands lies within Eminence Fire Protection District.

The Eminence District averages 225 fires annually, 154 in the spring and 71 during the

rest of the year. Fire-days (days on which one or more fires occur) occur on over one-half of the days during the spring fire season and on 25 percent of all days in the year.

(5). Control Problems – The linear nature of the park, steep slopes adjoining the river, previous suppression policies, inholdings, and local resident’s frequent use of fire are the major control considerations.

Access to most areas in the park is fair to good, travel times range from poor (two hours) to good (one hour and below), depending on location of a fire relative to suppression forces. Extreme fire behavior has been documented on some of the steep slopes or bluffs along the river. Long-standing Federal wildland fire suppression policies tended to allow extensive growth of brush and other fine fuels to accumulate fuel load levels significantly higher than those from the time of settlement until the early 20<sup>th</sup> century.

The use of fire by local residents to burn leaves and other springtime debris is common and with spring weather patterns, wildland fire starts are expected to affect the park. Because of the numerous inholdings, fires from this source of ignition are not uncommon. Fires moving from Ozark NSR to inholdings is also a potential problem. Coordination of suppression actions with the MDC is critical to quick, efficient suppression actions.

(6). Values to Protect – Public safety, park infrastructure within the Natural Zone, and inholdings are the primary values to be protected. T&E species are not expected to be affected by most wildland fires unless fires occur very close to caves used by the two species of endangered bats. Fire program staff must be familiar with historic structure locations, and every effort will be made to protect them either during suppression operations or on a proactive basis with hazard fuel reduction operations. Section 106 compliance will be completed prior to prescribed burning, and other fuels management activities. Complete descriptions and locations of resources at risk are found on GIS maps and other plans.

## **2. Historic FMU**

a. Characteristics – See [Section III.C.1.a](#) above.

The park has numerous cultural and archeological resources and sites. Most are closely associated with the river bottoms, although sites are well distributed within Ozark NSR.

NPS real property is scattered through the park and includes campgrounds, developed areas, boat landings, historic and modern buildings. Inholdings are also scattered through the park and are at risk from wildland fires and escaped prescribed fires.

Historic sites and the building count for are displayed in the table below.

**Table 2 – Historic Sites and Building Numbers**

Site	# of Units
Alley Spring	2

Big Spring	30
Buttin Rock	2
Chilton/Lesh Complex	12
Klepzig Complex	3
Lower Parker	1
Macy-Reed Cabin	1
Maggard-Howell Cabin	1
Nichols Complex	3
Parker Hollow	2
Powder Mill	1
Pulltite	1
Round Spring	1
Welch Spring	1
Total	61

#### **b. Fire Management Objectives**

- Contain 95% of all initial attack fires during the first burning period.
- Prevent wildland fires' potential adverse impact on cultural resources.
- Use prescribed fire to restore or maintain historic settings.
- Prescribed fires within all districts, zones or landscapes will have Section 106 compliance documentation prepared for cultural resources.
- Monitor fire behavior and fire effects on 100% of prescribed fires to provide information for future evaluation and program direction.
- Utilize mechanical treatments to reduce fuel loading around structures.

#### **c. Management Considerations**

- Firefighter caution in areas of acquired property with abandoned power lines and associated transformers (potential pollution hazard and safety issue).
- Avoid adverse effects on cultural or historic resources.
- Maintain Class II air quality.
- Bulldozers and other tracked vehicles will not be used without approval of the superintendent.
- Prevent escape of prescribed fire to the Missouri Ozark Forest Ecosystem Project (MOFEP).
- Avoid adverse effects on T&E species.

**d. Historic Role of Fire – See [Section III.C.1.d.](#)**

**e. Wildland Fire Management – See [Section III.C.1.e \(1\)-\(5\).](#)**

**(6). Values to Protect – Ozark NSR infrastructure, historic structures and**



inholdings are the primary values to be protected in the Historic FMU. Historic structure locations are well known and every effort will be made to protect them during suppression operations. During both suppression and prescribed fire operations, efforts will be made to avoid disturbance of cultural or archeological sites. Complete descriptions of locations and resources at risk are found on GIS maps and in other plans.

### **3. Developed FMU**

a. Characteristics – See [Section III.C.1.a](#) above.

NPS real property is scattered through the park and includes campgrounds, developed areas, boat landings, historic and modern buildings. The table below lists the site name, number of units and value from the FY 2002 FirePro run.

**Table 3 – NPS Real Property and Value**

<b>Site</b>	<b># of Units</b>	<b>Value</b>
<b>Akers</b>	<b>18</b>	<b>247,531</b>
<b>Alley Spring</b>	<b>35</b>	<b>1,434,453</b>
<b>Baptist Camp</b>	<b>2</b>	<b>549</b>
<b>Bay Creek</b>	<b>1</b>	<b>1,281</b>
<b>Big Spring</b>	<b>31</b>	<b>1,177,379</b>
<b>Blue Spring</b>	<b>2</b>	<b>13,484</b>
<b>Blue Spring JF</b>	<b>3</b>	<b>1,556</b>
<b>Cedar Grove</b>	<b>6</b>	<b>36,103</b>
<b>Chub Hollow</b>	<b>5</b>	<b>2,898</b>
<b>Cotton Farm</b>	<b>4</b>	<b>42,175</b>
<b>Dark Hollow</b>	<b>1</b>	<b>549</b>
<b>Devil's Well</b>	<b>4</b>	<b>40,133</b>
<b>Hawes</b>	<b>3</b>	<b>17,113</b>
<b>Jacks Fork</b>	<b>3</b>	<b>1,587</b>
<b>Jerk Tail</b>	<b>2</b>	<b>2,563</b>
<b>Jones Brothers Area</b>	<b>2</b>	<b>2,563</b>
<b>John Dixon Area</b>	<b>1</b>	<b>1,287</b>

Keaton's Camp	2	1,785
Lesh	3	1,142
Log Yard	3	5,258
Mill Creek	3	68,417
New Duplex at Round Spring	4	780,000
Partney	4	97,652
Pea Vine	2	25,351
Pistol Range	1	1,901
Powder Mill	12	338,332
Pulltite	22	227,430
Raft Yard	3	29,775
Round Spring	27	764,180
Rymers Ranch	2	2,563
Shawnee	5	102,990
Shawnee Creek	2	1,007
Shawnee Shop	2	44,082
Shockley	2	91,754
Sinking Creek	2	12,940
Trail Rides	1	1,647
Two Rivers	7	21,343
Welch Cave	6	139,809
Z Highway	2	23,281
Total		

#### **b. Fire Management Objectives**

- Contain 95% of all initial attack fires during the first burning period.
- Prevent wildland fires' adverse impact on Ozark NSR infrastructure from exceeding \$10,000 annually.
- Use prescribed fire where feasible to manage fuels.

#### **c. Management Considerations**

- Firefighter caution in areas with utilities.
- Protect visitors, employees and NPS facilities from wildland fire.
- Maintain Class II air quality.
- Bulldozers and other tracked vehicles will not be used without approval of the superintendent.

d. Historic Role of Fire – See [Section III.C.1.d.](#)

e. Wildland Fire Management – See [Section III.C.1.e \(1\)-\(5\).](#)

(6). Values to Protect – Park visitors and employees are the primary values to be protected in the Developed FMU, followed by Ozark NSR infrastructure. Every effort will be made to protect them during suppression operations.

#### **4. Special Use FMU**

a. Characteristics – See [Section III.C.1.a](#) above.

(1). Private, scenic easement, leased, and State-owned Lands. Primary authority over these lands rests with other governmental agencies (MDC and school districts) and individuals (private in-holdings, permits and easements) other than the National Park Service – with the exception of agricultural leases. A Land Management Agreement presently governs management of State-owned lands within the park. These lands are under state stewardship.

(2). Habitat Management Sub-Zone. This portion of the Special Use Zone has been the location of planned prescribed fires in the park. Field burning has historically been used by Ozark NSR, along with agriculture, to maintain some open fields in cleared conditions and to provide diverse wildlife habitat for both game and non-game native species. Fire is cost effective, and has relatively little adverse effect on the field habitats. Approximately 2,000 acres will continue to be leased back to private individuals and managed under agricultural permit.

b. Fire Management Objectives

- Contain 95% of all initial attack fires during the first burning period.
- Prevent 90% of wildland fires from moving onto park lands.
- Provide assistance as needed to cooperators responsible for fire protection on non-federal lands in the FMU.
- Provide assistance to park management in open field maintenance, as requested.

c. Management Considerations

- Firefighter caution in areas with utilities.
- NPS firefighters to provide structural assistance only on the outside of buildings.
- Maintain Class II air quality.
- Provide assistance to MDC and local fire departments to the greatest extent possible.

d. Historic Role of Fire – See [Section III.C.1.d.](#)

e. Wildland Fire Management – See [Section III.C.1.e \(1\)-\(4\).](#)

(5). Control Problems – The linear nature of the park, steep slopes adjoining the river, previous suppression policies, inholdings, and local resident's frequent use of fire are the major control issues.

Most of the area involved in this FMU is protected by others. Depending on the circumstances, either local fire departments or MDC have legal responsibility for suppression. Because of the intermingled nature of the inholdings, NPS firefighters normally respond to wildland fires on inholdings. The use of fire by local residents to burn leaves and other springtime debris is common and with spring weather patterns, wildland fire starts are expected to affect Ozark NSR lands. Fires from this source of ignition are not uncommon. Coordination of suppression actions with MDC is critical to quick, efficient suppression actions.

Areas in this FMU under Special Use Permit for agricultural use are Federal property and will be protected by Ozark NSR firefighters.

(6). Values to Protect – Improvement values in this FMU are owned by others, but assistance will be provided to the primary protection agency if possible. Fields managed as part of the historic landscape are Federal property and on leases to agricultural users.

## **IV. Wildland Fire Management**

### **A. General Management Considerations**

#### **1. GMP Direction**

The GMP provides the following specific direction for fire management. "Because aggressive fire suppression carried out over a number of years has caused an increase in ground fuels and other undesirable environmental changes, the National Park Service has considered the extent and the significance of such changes and the desirability of restoring the role of fire to the forest. Practices such as controlled burning and allowing naturally caused fires to run their course, providing that no threat to life or private property will occur and that the end result will be ecologically beneficial, will be considered."

Should multiple fires occur, priority will be assigned to those that threaten park visitors, employees, infrastructure, historic buildings, inholdings and other values at risk identified in [Section III.C](#). When multiple fires occur, lower priority fires may be managed within natural or human-made barriers until sufficient suppression forces are available to take more aggressive action.

### **B. Wildland Fire Use**

While the GMP endorses the concept of Wildland Fire Use in each of the FMUs, appropriate management response will be the preferred wildland fire management strategy. Wildland Fire Use, while a desirable method of applying fire to the landscape, is not feasible due to the linear nature of the park, the number of scattered inholdings, other non-Federal property and the limited number of natural ignitions in the park. Wildland Fire Use will not be considered under this FMP for Ozark National Scenic Riverways.

#### **1. Implementation Procedures**

As Wildland Fire Use is not an option under this FMP, full suppression action is expected with due consideration to firefighter and visitor safety. A Wildland Fire Implementation Plan (WFIP), Stage 1, is used for all fires. In cases of multiple fires however, completion of the WFIP may assist management in setting priorities for suppression.

## **C. Wildland Fire Suppression**

### **1. Fire Behavior**

Fire behavior expected under both average and extreme conditions for NFFL fuel model 9 can be found in [Section III.C.1.e](#).

### **2. Preparedness**

a. Prevention – The objectives of the Ozark NSR fire prevention program are: to prevent human caused wildland fires and, to incorporate prevention messages into interpretive programs. The Fire Prevention Plan is under revision.

b. Annual Training – Annual refresher training emphasizing safety is required and will be made available to Ozark NSR staff. Minimum training will include LCES, Standards for Survival, fire shelter training and other updates as appropriate. In addition, each year the Fire Management Officer (FMO) will assess the current qualifications of the park's fire qualified personnel. From this assessment, current and future training needs for both the park and individuals will be determined. Training will be obtained in the most cost-effective manner either in house or through interagency training courses. Qualified instructors will be utilized for all courses.

c. Readiness – Each year prior to and after the fire season, fire personnel will conduct an inventory of the District fire caches. Any needed supplies or equipment will be requested through the Fire Management Officer. The FMO will also be responsible for ensuring that fire tools and equipment are maintained in a state of readiness, especially during the fire season.

#### **d. Fire Weather and Fire Danger**

(1). Weather Stations – The primary weather station is station number 239004, Big Spring FTS. This station has been in place since November, 1994. NFDRS Model E is the selected model for fire danger predictions.

(2). NFDRS – Ozark NSR uses NFDRS Model E, Burning Index (BI) as the trend monitoring index and fire danger prediction scale. The Step-up Plan in [Appendix H](#) shows the break points for each individual staffing class along with the actions, both preparedness and prevention, required in each class.

(3). Monthly Risk Analysis – When weather and fuels appear to be outside the expected parameters, a monthly risk analysis will be conducted by the FMO. The items considered will include the items in the following table. Results should be passed on to the regional FMO for compilation and use for requesting additional funds and/or resources for severity staffing. Information developed from this analysis may be used to modify actions planned under various staffing classes in the Step-up Plan

**Table 4 – Monthly Risk Analysis**

MONTHLY Risk Analysis		
Factor	Current Level	Historic Average
Temperature levels (highs)		
Temperature levels (lows)		
Precipitation levels		
Keetch-Byram drought index		
1000 hour fuel moistures		
Live fuel moistures		
Unusual weather events ice storms, hard freezes		N/A
Unusual fire load		
30-90 day temperature forecast		N/A
30-90 day precipitation forecast		N/A

e. Step up Plan –The Step-up Plan for Ozark NSR describes the degree of response capability the park will undertake as fire danger increases (see Appendix H). The plan is based on the 1978 National Fire Danger Rating System's burning index and components.

Weather observations will be taken at the fire weather station at Big Spring daily via automated weather station. NFDRS Fuel Model E will be uniformly used as the primary model for rating fire danger in the park, since it represents the fuel type in which 90% of historic fire occurred, and all the other fuel types are scattered and patchy. Weather observations and fuel measurements will be taken each burning period, and the NFDRS BI computed. Specific actions and trigger points are listed in the Step-up Plan in [Appendix H](#).

### **3. Pre-attack Plan**

The Pre-attack plan is essentially a checklist of items to be considered prior to wildland fire occurrence. The table is divided into four parts that correspond to four of the functions found in the Incident Command System and is found in [Appendix G](#).

### **4. Initial Attack**

a. Setting initial attack priorities involves determining the FMU involved, risk of fire to visiting public and firefighters, resources at risk, existing fires and threat to adjoining

property. With multiple ignitions, the FMUs by priority are: Developed, Historic, Natural and Special Use. Within each FMU a set of priorities also exists and are listed in the sections below.

(1). FMU III, Developed FMU – This FMU contains many NPS buildings and other infrastructure. Because visitors may be present in concentration, fires in this FMU will receive the top priority for initial attack if fires in other FMUs are reported simultaneously

(2). FMU II, Historic FMU – Fire threatening identified historic resources will receive the first priority for suppression in this FMU and will be aggressively attacked. Known cultural and archeological resources will be protected from suppression action damage to the greatest extent possible.

(3). FMU I, Natural FMU – All fires will be aggressively suppressed with due consideration of firefighter and public safety. Priority will be given to fires threatening private inholdings, or adjacent residential property. Second priority will be given to visitor use areas and third to unoccupied habitats.

(4). FMU IV, Special Use FMU – Most initial attack in this park is the responsibility of others (local fire department or MDC). When resources are available or are the closest force, NPS will take initial attack action until the appropriate agency can take over the incident.

Maps of developed areas are available in the fire management office.

b. Normally initial attack crews will be comprised of at least two "redcarded" firefighters equipped with personal protective equipment. A radio and tools such as rakes, back-pack pumps, etc., will be carried in all patrol trucks. Additional gear such as fire engines, pumps, hose, fuel, etc. may be provided by back-up crews as needed. Allocation of personnel will be accomplished with a minimum of disruption to Ozark NSR visitor services or operations. In order to effectively meet this objective, members of the Maintenance, Ranger and Interpretation Divisions and/or non-park personnel will be used when necessary to supplement suppression crews for initial attack, and project fire operations.

Small fires will be controlled, if possible by an initial attack handcrew or engine. An initial attack crew on a larger fire will be reinforced by additional firefighters. In most cases an effort should be made not to tie up a number of crews on one fire to the point that the remainder of the park is left under-staffed. If additional personnel or equipment are needed on the fire, the Incident Commander will notify the Ozark NSR Fire Program Assistant or FMO who will arrange for additional suppression forces and/or cover crews to be available for initial dispatch.

Tractor plows and bulldozers can only be used with the approval of the superintendent, unless there is an immediate threat to life or property.

If a fire occurs within the Historic FMU, the FMO will notify the Cultural Resource Specialist to document impacts.

- a. **Confinement as an Initial Attack Suppression Strategy** – Confinement as an appropriate management response during Initial Attack. Confinement strategies, utilizing natural openings or other natural or man-made features may be used in all FMU's except in the Development FMU.
- b. **Response Times** – For most fires, response time by NPS equipment and personnel will run up to 60 minutes depending on location of fire and responding personnel.

e. Management Constraints – The suppression tactics to be used at Ozark National Scenic Riverways include use of water or foam firelines in conjunction with natural barriers to reduce damage potential from suppression actions. Water will generally be supplied by engines operating from established roads and/or trails. There are three primary management constraints:

- The use of bulldozers or heavy equipment in suppression or prescribed fire operations may be authorized by the Superintendent or designee.
- Engines and ATVs will be restricted from areas identified as potentially affected by vehicle traffic where rutting, soil compaction or other habitat damage could occur.
- Handlines will be constructed only in areas where damage to archeological and/or historic resources is not likely to occur.

The incident commander may authorize the use of heavy equipment if an immediate threat to human health or safety exists.

f. Local Issues – Close communication with local units of government, adjacent landowners, and inholding owners should minimize wildland fire controversy.

## **5. Extended Attack and Large Fire Suppression**

a. Extended attack needs – Based on the fire history from 1971, few fires will remain uncontrolled past the first burning period. The largest fire in Ozark NSR was 273 acres in 1979.

MDC personnel will respond under a General Agreement (mutual aid) if resources are available and not committed to their own suppression activities. The park will provide reciprocal assistance to MDC if requested.

The Mark Twain National Forest and Ozark National Scenic Riverways have an Interagency Mutual Aid Agreement which has expired and is being revised.

For large fires requiring large numbers of personnel or other resources, contact with the Iowa-Missouri Interagency Coordination Center will bring any necessary resources from national sources. The current contact information is found in [Appendix E](#).

b. Implementation Plan Requirements – A Wildland Fire Implementation Plan (WFIP) is in general a size-up and should be conducted for the initial attack. Wildland Fire Situation Analysis (WFSA) development will be required at the point where the second burning period will not see control of fire spread. At this point a WFSA will be completed each day until the fire is surrounded by firelines or natural or other barriers that will stop fire spread. The WFSA will be validated until the fire is under control.

c. Complexity Decision – When a WFSA has been completed for use during the operations on a second burning period, the fire will be considered to be an extended attack fire.

d. Delegation of Authority – A sample delegation of authority to an incident commander is included in [Appendix E](#).

## **6. Exceeding Existing WFIP**



The WIFP has three stages: I, II and III. Stages I and II will be used for suppression actions. Stage III would generally be used for wildland fire use.

- a. If the fire is the result of an escaped prescribed fire, a Wildland Fire Situation Analysis will be completed and a new strategy selected based on the results.
- b. If the initial attack appropriate management response was a confinement strategy and operations continue into a second operational period, a WFSA will be completed and new strategy selected if appropriate.

#### **7. Minimum Impact Suppression Tactics (MIST)**

Director's Order #18 states that: "Methods used to suppress wildland fires should minimize impacts of the suppression action and the fire, commensurate with effective control and resource values to be protected." Specific restrictions are listed in [IV.C.4.e](#).

Every effort should be made to use natural and existing man-made control lines, rather than new lines, to minimize bare soil and erosion potential.

#### **8. Fire Rehabilitation**

In this park, the only rehabilitation needs anticipated are those associated with fireline construction and mop-up activities. Proper placement of hand constructed firelines should reduce the need for major work. Areas with handlines will be restored to their pre-fire condition as soon as possible to minimize soil loss by erosion. The nature of fires in the park indicates that long term rehabilitation should not be necessary. Should a Burned Area Emergency Rehabilitation Team (BAER) be required, an archeologist or cultural resource specialist will be part of the team. Following are guidelines specific to Ozarks NSR:

- a. Resource Management staff will be consulted to determine specific rehabilitation concerns on each wildland fire.
- b. Trash will be removed from lines, camp locations and other staging areas.
- c. Should waterbars be necessary they will be installed every 70-200 feet for slopes 0 to 15%, 50-70 feet for 15-30%, and 30-50 feet for 30+% slope.
- d. Stumps will be cut within 3 inches of the ground.
- e. All snags or trees felled will be lopped and the branches scattered.
- f. Rehabilitation will occur before outside resources are released from the fire to the greatest extent possible.

#### **9. Records and Reports**

The Superintendent is ultimately responsible for fire reporting and fiscal accounting. The following individual report assignments are delegated by the Superintendent as indicated.

Table 5 – Wildland Fire Reporting Checklist

CHECKLIST OF WILDLAND FIRE DOCUMENTS AND REPORTS		
Document Revision Or Preparation Responsible Frequency Party		
DI-1202	Each Incident	Incident Commander
WFSA	As Needed	Park Management/IC
Fire Weather	Daily In Season	FMO
Fire Situation Report	Daily In Season	FMO
Fire Danger	Daily In Season	FMO
Fire Complexity Analysis	Per Incident As Needed	Incident Commander
Monthly Risk Analysis	Monthly	FMO
Pre-Attack Plan	Annually	FMO
Wildland Fire Critique	Each Incident	On Site Suppression Staff

Time and filing deadlines are associated with each of these reports and will control scheduling and response times.

## V. FUELS MANAGEMENT

### A. Long-term Fuels Management

Over the period of this plan, Ozark NSR staff intends to implement a fuels management program that includes the use of prescribed fire and mechanical treatments. Implementation of the program will contribute to achieving the goals and objectives found in [Section II.E](#).

The primary purpose of the program in the Natural FMU is to enhance natural resources in the park, and protect inholdings and NPS infrastructure. Due to the presence of inholdings and wildland-urban interface conditions, prescribed fire will be carefully planned and executed.

Prescribed fire projects will be directed toward maintaining ecosystem health, cultural landscapes and protecting natural resources from catastrophic fires. Hazard fuels reduction will be one of the results of prescribed fire. As specific needs are identified, project proposals will be prepared and funding requested. The current proposed schedule is in Appendix I.

In the Developed FMU normal maintenance operations will occur. This will include mowing and grounds maintenance. For the Historic FMU most operations will be normal maintenance. Fire may be

used to treat fuels as needed in both the Developed and Historic FMUs.

## **B. Prescribed Fire**

### **1. Ten-Year Project Schedule**

A ten-year schedule for prescribed fire projects was completed by Ozark NSR fire staff during the summer of 2002 (Appendix I). The schedule was created through consultation with members of Ozark NSR Resource Management and staff members from cooperating agencies. Input from these groups was taken from a series of meetings and correspondence in the spring of 2002. The current plan features the inclusion of previously burned units that predate the fire effects monitoring era, multiple burns in each unit, and several new units.

The schedule is intended to serve as a guiding document for fuel treatments using prescribed fire at Ozark NSR for the years 2003-2012, and reflects the park's vision of using prescribed fire to achieve community restoration goals over the next ten years. As such, the plan emphasizes the creation of landscape-scale blocks composed of multiple burn units with similar fire regimes. Cooperative burns with interagency partners are also emphasized, which furthers the ability to effect landscape scale restoration.

This schedule will be reviewed annually to assess project funding, viability and to initiate planning with other agencies, as required.

### **2. Long-term Prescribed Fire Relation to FMUs**

Three FMUs (Natural, Historic, and Special Use) exist in the park that will potentially support prescribed fire. Burn units within the FMUs are not yet fully identified, as some areas require additional evaluation to determine the appropriate fuel management or vegetative manipulation level of effort. All planned burn units can be found in Appendix I. All of the units lie within the Natural FMU, and all have the same fire regime and condition class.

### **3. Personnel Requirements**

A qualified Prescribed Burn Boss will conduct all prescribed fires with qualified support personnel present to accomplish the objectives agreed to in the plan. Qualified personnel will monitor fire behavior and fire effects, control hot spots and spot fires, support ignition needs, and complete initial attack on any escaped fires. Other fire qualified personnel from group units may be asked to assist on an ad hoc basis. The term "qualified" as used here means the individual meets the standards in the Wildland and Prescribed Fire Qualifications System Guide, 310-1.

### **4. Weather, Fire Behavior and Fire Effects Monitoring**

Weather, fire behavior and fire effects monitoring will generally follow protocols outline in the Fire Monitoring Handbook (NPS 2001). A Fire Monitoring Plan has been completed (April 2000), and is included as [Appendix F](#). Fire weather data used in development of prescriptions is routinely entered into the Weather Information Management System (WIMS). This information provides some inputs for the BEHAVE modeling tool. An on-site monitor will take and record weather and fire behavior observations hourly during the execution of the burn. When combined with the information gathered on fire effects, a reasonably complete view of the success or failure of the operation should emerge.

### **5. Critique of Prescribed Fire Operation**

The following items, as a minimum, will be reviewed following each prescribed fire operation.

- Were any unsafe acts noted?
- Were burn objectives met within an acceptable range of results? :
- What should be done differently to obtain desired results or get better results?
- Was there any deviation from plan? If so, why?
- Was prescription appropriate?
- Were weather changes a factor in accomplishing burn?
- Problems and general comments:

#### 6. Documentation and Reporting

The following table lists the reports and other documents required for prescribed fire operations.

**Table 6 – Prescribed Fire Document Checklist**

<b>Checklist of Prescribed Fire Documents and Reports</b>		
<b>Document Revision or Preparation Responsible Party</b>		
<b>Frequency</b>		
FirePro Project Submission	Annual	FMO
Original Signed Prescribed Fire Plan	Each Project	Superintendent
Checklist of Pre-Burn Prescribed Fire Activities (no specific form)	Each Project	Prescribed Fire Burn Boss
All Reviewer Comments	Each Project	Reviewers
All Maps	Each Project	FMO\Prescribed Fire Burn Boss
Notification Checklist	Each Project	Prescribed Fire Burn Boss/Fire Information Specialist
Permits such as burn, smoke, etc.	Each Project	FMO\Prescribed Fire Burn Boss
Monitoring data	Each Project	Prescribed Fire Monitor
Weather forecasts	Each Project	FMO\Prescribed Fire burn Boss
Agency Administrator Go/No-Go Pre-Ignition Approval	Each Project	Superintendent
Operational Go/No-Go Checklist	Each Project	Prescribed Fire Burn Boss
Incident Action Plan(s)	Each Project	FMO\Prescribed Fire Burn Boss
Unit logs, Daily Validation or other unit leader documentation	Each Project	FMO\Prescribed Fire Burn Boss
Press Releases, Public Comments, and Complaints	Each Project	Fire Information Specialist

Smoke dispersal information	Each Project	FMO\Prescribed Fire Burn Boss
Post fire analysis (Critique)	Each Project	All Participants in Operation
Fire Occurrence (DI-1202) report (Must also be reported in SACS)	Each Project	Prescribed Fire Burn Boss

Time and filing deadlines are associated with each of these reports and will control scheduling and response times.

## **7. Historic Fuel Treatments**

The map depicting historic treatments will be a part of the GIS as information on fuel treatments is added to the system.

## **C. Prescribed Fire Plan**

Prescribed fire plan requirements at Ozark National Scenic Riverways are similar to the requirements at other NPS units. A detailed outline and discussion is found in RM-18, Chapter 10. Ozark NSR prescribed fire plans have the following specific requirements:

- Signature Page
- Executive Summary
- Description of Area
- Goals and Objectives
- Risk Management
- Project Complexity
- Organization
- Cost
- Scheduling
- Pre-burn Considerations
- Ignition and Holding Actions
- Wildland Fire Transition Plan
- Protection of Sensitive Features
- Public and Firefighter Safety
- Smoke Management
- Interagency Coordination and Public Information
- Monitoring
- Post Fire Rehabilitation
- Reporting Needs
- Appendices
- Reviewer Comments
- Technical Reviewer Checklist and Comments
- Project Map
- Prescribed Fire Complexity Rating Worksheet
- Fire Modeling Outputs
- Holding Resources Worksheet
- Agency Administrator GO/NO-GO Pre-ignition Approval
- Prescribed Fire Operations GO/NO-GO Checklist

## **D. Exceeding Prescribed Fire Plan**

In instances where the Wildland Fire Transition Plan is implemented, a Wildland Fire Situation Analysis will be completed and an appropriate management response will be initiated based on the WFSA.

## **E. Air Quality and Smoke Management**

### **1. Air Quality Issues**

There are multiple targets for smoke. The area is a Class II air quality location and visibility is generally good. Spring burning occurs not only on NPS lands but on USFS lands to the south and east, and state owned lands to the west. The ability of the airshed to disperse the volume of smoke produced can be impaired occasionally. Due to the topography of the park, there is a tendency for residual smoke to settle into the river bottoms affecting visitors, employees and residents. Unwanted wildland fires are normally of short duration and have little effect on air quality past the initial burning period.

### **2. Smoke Management**

Ozark National Scenic Riverways is within an area of southeast Missouri classified as an attainment area by the Environmental Protection Agency (EPA). No "criteria pollutants" exceed allowable standards. Concentrations of particulate matter, sulfur dioxide, and nitrogen dioxide have been monitored for over ten years at an EPA monitoring station in Eminence. Air quality is good. No primary or secondary ambient air quality standards have been exceeded at this location. The main emphasis of smoke management is the safety of motorists. The park has very good air quality, but fog is quite common near the river and can produce cumulative impacts on visibility at night and just after dawn.

a. Class I Airsheds – The only Class I area in the state of Missouri, Hercules-Glades, is located about 70 miles south and west of Ozark NSR on the Mark Twain National Forest in Taney County. It is not expected to be bothered by smoke production from prescribed fires in the park.

a. Smoke Sensitive Areas – The communities of Eminence, Winona, Mountain View, and Van Buren are the most populated smoke sensitive targets in the vicinity of the park. Other targets include: hospitals in Ellington, and Mountain View; nursing homes in Birch Tree, and Mountain View; airports in Mountain View, Van Buren, and Ellington. Campgrounds and other visitor facilities are also targets.

Within Ozark NSR lies a multitude of caves, some of which contain Threatened and Endangered species. Mitigation for this smoke issue will be done on a case-by-case basis, and the effect of smoke on bat populations will be a priority consideration.

All smoke sensitive areas within 20 miles downwind of proposed prescribed fires should be identified. There are numerous small communities along the river corridors that are subject to smoke impacts.

b. There are no current restrictions, however the amount of prescribed fire applied by all the agencies in the river basin does have potential to create problems which might be solved by restriction or regulation. A cooperative effort to manage smoke from prescribed fires is ongoing. No burning permits are currently required.

#### **d. Mitigation Strategies**

(1). Planned prescribed fires – Fires to improve resource values will have a smoke dispersion component in the prescription. If smoke creates a prolonged hazard or significant nuisance, appropriate actions will be taken to mitigate the condition causing the problem or the fire will be suppressed.

(2). Suppression – Suppress or mop up smoldering fuels when they are likely to generate smoke management "problems."

(3). Ignition – Ignite smoldering fuels to get them to burn with an active flame, which generates less than half the emissions than smoldering combustion. Flaming combustion also generates convection columns, which raise smoke above ground level.

(4). Types of Fires – Use backing fires when possible.

(5). Dispersion – Recognize poor dispersion conditions that will last several days, such as the predicted passage of a slow-moving warm front; a lingering high pressure system with stable atmosphere; or high humidity conditions, and adjust burning strategies as necessary.

(6). Residual Smoke – When a fire has burned for an extended period of time and generated a lot of residual smoke, the NPS will consider appropriate actions to minimize additional smoke production.

(7). Firefighter Safety – During high smoke production phases of a fire suppression operation, crews will be rotated out of high smoke areas.

(8). Sensitive Areas – Planned prescribed fire ignitions in sensitive areas will be done either when visitation is low, or the Superintendent will restrict entry to areas potentially impacted by smoke.

e. Guidelines – The following are the management guidelines for all phases of the fire management program.

- No prescribed fires will be ignited during air pollution alerts, or when a burn ban has been established by any local government.
- Fire weather forecasts will be used to predict smoke dispersal.
- Burning will be done when conditions result in rapid smoke dispersal.
- Proper firing techniques to lower smoke production will be utilized.
- Smoke projection maps will be prepared to assist in projecting smoke dispersal patterns.
- Local police and fire agencies will be notified of any planned prescribed fire so they may provide any needed assistance with traffic flow should problems with smoke dispersal occur.
- Prescribed fires will be planned and conducted when proper wind flow will disperse smoke over unpopulated or low density populated areas.

## **F. Non-Fire Applications**

During the current planning horizon (2002-2007), several manual fuel hazard treatments will be undertaken in the park. These treatments will be completed using chainsaws and other handtools. Mechanical projects may be undertaken to ensure defensible space in the Wildland-Urban Interface, though no projects are currently planned. No schedule exists for manual or mechanical fuel reduction projects. Such activities will be developed on an annual basis until such time as a schedule can be prepared.

### **1. Annual Activities**

Each project will require approximately 1½ weeks to cut and prepare the project area for fire application. A request will be made during the prior year for funding to support the project.

### **2. Seasonal Restrictions**

To protect remnant native vegetation, mechanical treatments are best completed prior to the active growth period or after dormancy.

### 3. Monitoring

Short and long-term monitoring will concentrate on measurements of acres treated and stems removed. Further techniques (photo points, fuel load transects, plots, etc.) will be applied as needed, and on a case-by-case basis. As soon as fire can be applied to the treated area, monitoring will be as defined in the Wildland and Prescribed Fire Monitoring Plan ([Appendix F](#)).

### 4. Critique of Project

The following items, at a minimum, will be reviewed following each mechanical treatment.

- Were any unsafe acts noted?
- Were treatment objectives met within an acceptable range of results? :
- What should be done differently to obtain desired results or get better results?
- Was there any deviation from plan? If so, why?
- Were weather changes a factor in completing treatment?
- Problems and general comments:

### 5. Cost Accounting

Records of costs associated with the project will be kept by the Fire Program Assistant.

### 6. Documentation and Reporting

The following table lists the reports and other documents required for non-fire hazard fuel treatments.

Table 7 – Mechanical Treatment Reporting Checklist

Checklist of Mechanical Fuel Treatment Documents and Reports		
Document Revision or Preparation Responsible Party Frequency		
FirePro Project Submission	Annual	FMO
Signed Project Plan	Each Project	Superintendent
Project Maps	Each Project	FMO\Project Manager
Notification Checklist	Each Project	Fire Information Specialist
Permits	Each Project	Local Staff
On-Site Effects Reporting	Each Project	Monitor
Unit Logs or Other Documentation	Each Project	Local\Project Staff
Contracts	Each Project	Local\Project Staff



Project Critique	Each Project	Project Staff
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Time and filing deadlines are associated with each of these reports and will control scheduling and response times.

## **7. Annual Project List**

When the list of mechanical, chemical or other non-fire projects is completed it will be found in the second table in [Appendix I](#).

# **VI. FIRE MANAGEMENT ORGANIZATION AND RESPONSIBILITIES**

## **A. Fire Organization Structure**

### **1. Fire Management Officer**

The Fire Management Officer will oversee all suppression operations and planned prescribed fires and is responsible for day-to-day fire management operations at the park level. The FMO also has responsibility for planning training, arranging fitness testing, updating plans, preparing prescribed fire plans, and WFSAs for escaped wildland or prescribed fires.

### **2. Fire Prevention/Education/WUI Specialist**

This individual is involved in public outreach and education, in the park and other supported NPS fire units, to explain the fire program from both a suppression/prevention viewpoint and a prescribed fire viewpoint. This person acts as liaison between NPS personnel, other agencies and general public, and serves as primary contact for WUI projects, and the Rural Fire Assistance Program.

### **3. Fire Ecologist**

The Fire Ecologist is responsible for oversight of the fire effects monitoring program in the park, and in other supported NPS units. Establishes monitoring protocols and maintains the monitoring plans for supported units. Assistance is provided by permanent and seasonal fire monitors and seasonal firefighters when available.

### **1. Lead Fire Effects Monitor**

The Lead Monitor acts as the field leader of the seasonal fire effects crew, and is responsible for following established protocols in the collection of short term and long term fire effects data.

### **5. Fire Program Assistant**

Maintains all records for the fire program as well as keeping accounts, FirePro submissions, qualification records and fire reports (DI-1202) up to date.

### **6. Engine Foreman**

Maintains engine and other fire equipment. Is frequently the initial attack incident commander and provides supervision to seasonal firefighters.

#### **7. Fairshare Dispatcher**

This person is part of the interagency dispatch operation in Rolla at the Missouri Iowa Coordination Center (MOCC) hosted by the Mark Twain National Forest.

#### **8. Fairshare Helitack**

Currently there are 2 NPS funded positions with a duty station at the Rolla Helibase.

### **B. FirePro Funding**

FirePro funding is available for approved equipment needs and staffing. Project proposals, for prescribed fire, are submitted through normal channels for approval. All positions are available to support other NPS units as well as USFS and MDC.

### **C. Fire Organization Structure Related to Park Organization**

#### **1. Superintendent or Designee**

Responsible for the overall program direction. Has final decision making authority for management operations. Approves and signs Interagency Agreements pertaining to the park. Approves prescribed burn plans, WFSA's for escaped wildland fires or prescribed fires.

#### **2. Fire Management Officer**

The Fire Management Officer will oversee all suppression operations and planned prescribed fires and is responsible for day-to-day fire management operations at the park level. Coordinates operations with Natural Resource Specialist.

#### **3. Chief Ranger**

During any fire operations, wildland fire suppression, or planned prescribed fires, will act, with the Fire Prevention/Education Specialist, as liaison between NPS personnel, other agencies and general public.

#### **4. Fire Ecologist**

Works with Natural Resource Specialist to accomplish monitoring and evaluation of prescribed fire effects.

#### **5. Fire Prevention/Education/WUI Specialist**

Works with fire staff, interpreters, and natural resource managers to prepare and present fire ecology education materials and fire prevention messages. Works with other park staff to distribute press releases and other fire information in prescribed fire and wildland fire situations.

### **D. Interagency Coordination and Agreements**

Ozark NSR maintains a good working relationship with local Volunteer Fire Departments, the Missouri Department of Conservation and the Mark Twain National Forest. In Van Buren, the office

facility is shared with the U.S. Forest Service and MDC.

The Missouri-Iowa Interagency Coordination Center is managed by the Mark Twain National Forest and can be contacted for assistance at any time circumstances dictate. This contact will bring any resources necessary to the assistance of the park. The center is located at Rolla, MO and can be reached at (573) 341-7484.

#### E. Key Interagency Contacts

Mark Twain Fire Management Officer (573) 341-7486

MO Department of Conservation District (573) 226-3616

MO Department of Conservation Regional Office (417) 256-7161

Mark Twain Zone FMO Zone 1 Rolla (573) 341-7486

Mark Twain Zone FMO Zone 2 Winona (573) 325-4233

#### F. Fire-related Agreements

The following table lists the government agencies and fire departments responsible for protection and the agreement date. These agreements may also cover other non-law enforcement emergency responses (search and rescue, spills, structural fire, etc.) The agreements are located in [Appendix E](#).

Table 8 – Cooperative Agreements

Cooperator	Date Signed	Key Official	Renewal Date
Van Buren Fire Department	3/20/2002	Fire Chief	3/20/2007
Timber Community Fire Protection District	3/11/2002	President	3/11/2007
Jadwin Rural Fire Department	3/11/2002	Fire Board President	3/11/2007
Eminence Area Fire Department	6/20/2001	Fire Chief	6/20/2006
Little Black/Grandin Volunteer Fire Department	10/5/2001	Fire Chief	10/5/2006
Mountain View Fire Department		Fire Chief	

The Nature Conservancy	12/14/1997	Lower Ozarks Project Director	12/14/2002
Missouri Department of Conservation	06/24/2003	Director	06/24/2008
Missouri & Iowa Interagency Coordination Center	12/2/2001	Center Director	12/2/2006
Mark Twain National Forest	Expired	Forest Supervisor	

## VII. FIRE RESEARCH

### A. Previous and Ongoing Fire-Related Research

A report titled "Glades of the Ozark National Scenic Riverways" was completed in 1992 (Ver Hoef and others). This study of the fire-adapted glade community type forms the basis for much of the current fire management program at Ozark NSR. A dendrochronology study detailing the fire history of uplands in the Current River watershed has also been completed (Guyette, 1995). Dr. Guyette is currently working on a similar study to determine the fire regime and fire history of the riparian communities of Ozark NSR. This research will provide critical information on the fire ecology of two at-risk species: giant cane (*Arundinaria gigantea*) and bur oak (*Quercus macrocarpa*).

### B. Fire Research Needs

For future research, four key topics are identified.

#### 1. Surveys

Archeological, ethnographic, and cultural object surveys are needed to protect those resources during wildland fire or prescribed fire operations. Cultural landscape surveys are needed to establish visual objectives for prescribed fire implementation.

#### 2. Fire Effects

Studies to determine the effects of fire on water quality (both perennial and subsurface/karst sources) are needed to help managers plan prescribed fires in relation to riparian zones. Studies to determine the effects of fire or fire exclusion on sensitive and disappearing canebrakes are needed, especially with regard to the Swainson's warbler. The effects of fire on exotics should be studied to ensure fire operations do not unwittingly enhance the growth or spread of exotic plants. An accurate smoke model that includes Ozark topography in its analysis is needed for assessment of smoke on wildlife (especially endangered bats) and human populations. Other research questions include: How do fire effects differ at varying geographic and temporal scales? What are the relative contributions of fire intensity and severity to various fire effects? How do fire behavior and effects differ by ecological land type?

### **3. Fuels and Vegetation Mapping**

Physical fuel properties need study to determine if existing fuel models predict both behavior and fire danger rating adequately or if a custom fuel model should be developed. Accurate vegetation mapping is a critical need for the fire program, from a resource management perspective, and for Wildland/Urban Interface hazard assessment.

### **4. Wildland-Urban Interface**

Structures and other values that could be threatened in the event of a wildland fire must be mapped, and included in basic fire program information. The park is working to develop these maps, through coordination with cooperative Rural Fire Departments, and an upcoming vegetation/fuels mapping project. This will guide future WUI project proposals and implementation. Social science research is needed to determine the content of information campaigns which will most effectively influence local public behavior.

## **VIII. MONITORING**

### **A. Programs**

A program to monitor fire effects was initiated in 1999 and is currently being implemented. The complete program is detailed in [Appendix F](#). The FMP identifies general fire management goals and objectives for the park. Addressing if, and how well, the management application of fire is meeting defined resource management objectives is addressed by the Fire Monitoring Plan.

#### **1. Short-term monitoring**

The definition of short-term monitoring as used in this park is monitoring done to measure fire effects on vegetation, fuel reduction and other measurable changes occurring immediately following fire application.

#### **2. Long-term Monitoring**

Long-term monitoring at Ozark NSR is defined as that level of effort required to track changes in vegetative composition occurring over a multi-year period.

### **B. Fire Monitoring Handbook**

The sampling methods used to monitor fire effects at Ozark NSR are those described in the NPS standard, the Fire Monitoring Handbook (2001). The Fire Monitoring Plan is designed to provide guidance in establishing and implementing sound fire monitoring protocols at Ozark National Scenic Riverways while complying with the FMH. The protocols will be used to:

- assess fire behavior (both prescribed fire and unwanted wildland fire);
- determine whether the resource management objectives of prescribed fire are being met;
- determine whether the fire regime is producing unintended negative impacts.

### **C. Fire Monitoring Plan**

The Monitoring Plan in [Appendix F](#) discusses in detail the level of effort for each habitat to be monitored. Included are specific results desired to measure goal achievement in the various habitats.

## **Ix. Public safety**

### **A. Issues and Concerns**

The primary safety concerns are homes and businesses within and adjacent to the park. Most homes have fuel breaks, roads, driveways, and lawns around them. All fire management projects will be conducted with public safety as a primary objective. The priority for such projects will reflect the park's commitment to mitigating hazard fuel build-up and preventing wildland fire movement into populated areas.

A second concern is the safety of visitors within the park, camping or hiking along the river. In the adjacent bluffs and other difficult topography, hikers could be caught unaware of fires in the vicinity. To a lesser degree there is a hazard from smoke on the highways traversing the park. Many of the roads are moderately narrow and carry a moderate traffic load, especially during the summer months. Movement away from fire areas should not be too difficult. Management of residential traffic may require assistance from local or county authorities.

### **B. Mitigation**

In order to make NPS employees and the general public aware of such hazards, the following mitigation measures will be considered:

- General public will be made aware of wildland fires and prescribed fires through press releases and general interpretive presentations.
- Safety briefings will be conducted for NPS personnel prior to any participation in wildland suppression or prescribed fires.
- Appropriate regulatory and/or enforcement agencies will be notified prior to any prescribed fires to assist in safely managing pedestrian, equestrian or vehicular traffic. Warning signs will be posted along roads and trails as necessary.
- All fire personnel will be reminded of the "18 Situations That Shout Watch Out" and will be expected to comply with the "10 Standard Fire Orders".

## **X. PUBLIC INFORMATION AND EDUCATION**

### **A. Capability and Needs**

Ozark NSR will conduct an active fire prevention program with appropriate emphasis prior to the fire season and during high-risk periods. This will primarily be an effort to communicate through media and public contacts a greater awareness of wildland fire prevention. Signing will be used at strategically located points throughout the park to indicate high-risk periods, and personal contacts will be emphasized during hunting season, as hunter camps are visited and recorded by rangers.

Emphasis will be placed on interpreting the role of fire as a natural process. The common and long-term use of prescribed fire by the adjacent Doniphan and Eleven Points Districts of the Mark Twain National Forest, and the Missouri Department of Conservation at Peck Ranch has made the public reasonably receptive and informed regarding prescribed burning.

To further public information and education, the following guidelines will be followed:

- If possible, timely and accurate information will be provided to the media and Ozark NSR visitors regarding the status of fire actions and suppression efforts.
- Informational handouts explaining the fire management program will be prepared and updated as necessary. During periods when prescribed fires are burning, these handouts will be distributed widely.
- The prescribed fire program plans and implementation will be discussed in informal contacts with park personnel, concessionaires, permittees, neighbors and visitors.
- Adjacent landowners will be notified when fire, particularly wildland fire, is a threat to off-park residential areas, and inholding properties.
- Interpretive exhibits and programs should occur in season whenever opportunities allow.

## **B. Response to Increasing Fire Activities**

When the staffing class is at SC-4 or SC-5, information will be prominently displayed at visitor contact points. Patrol activity will be increased to detect potential fires and to monitor visitor activity. At SC-5 it may become necessary to close portions of the park to protect the public.

# **XI. PROTECTION OF SENSITIVE RESOURCES**

## **A. Cultural Resources**

### **1. Resources**

There are numerous archeological and cultural resources to be protected throughout the park. Historic properties are widely scattered across the park although most are in the Historic FMU. Every effort will be made to protect archeological and ethnographic sites - both known, and those discovered as a result of fire on the landscape. Because many of the historic and cultural areas are near roads, protection from wildland fire should not be difficult.

### **2. Mitigation**

- 2.
3. In all locations every effort will be made to avoid damage to identified resources during suppression and prescribed fire operations. Archeologists or cultural resource specialists will be involved in all operations to the maximum extent feasible. The SHPO will be informed and/or consulted prior to prescribed fires. Traditionally-associated groups such as the Cherokee, Osage, Delaware, and Shawnee Native Americans have been consulted, with regard to fire at ONSR.

## **B. Natural Resources**

### **1. Resources**

The natural resources most at risk from wildland fire at Ozark National Scenic Riverways are the riparian vegetation and glades vegetation. Although effects of fire on cave habitats are not well known, many caves exist along the river and could potentially be affected by smoke. No plant species are listed as federally Threatened and Endangered. If species are added to the T&E list, they will be protected when locations are known. Both bat species on the Federal list are found in caves in the park. They are not thought to be at risk of inadvertent taking, but could be disturbed for the duration of a smoke event. Species lists for the park can be found on the University of California, Davis NPS Flora and Fauna Species Database. The URL is

listed under Appendix A.

## **2. Mitigation**

Generally, efforts will be directed at keeping fire from moving into riparian habitat. Exceptions to this include burning to restore river cane communities and riparian oak savannas. Ignitions in all habitats will be managed with the least disturbance possible. The glade areas will be protected from unnecessary ground disturbance to the greatest extent possible. Prescribed fire plans will address potential effects of smoke on bats. Management of wildland fires will also consider effects of smoke on bats to the extent that personnel are not placed in jeopardy.

## **C. Infrastructure/Inholdings**

### **1. Improvements**

There are overlaps between infrastructure and historic buildings in Ozark NSR. The Historic FMU, Developed FMU and Special Use FMU have significant numbers of structures at risk. In the historic and developed areas, NPS has primary responsibility for suppression. In the Special Use FMU, primary protection responsibility lies with the MDC and local fire departments although NPS has a secondary response role to protect inholdings. Some the improvements to be protected include the cabins at Big Spring and the mill at Alley Spring. A table listing sites and number of historic buildings is found in [Section III.C.2](#). A similar table for NPS infrastructure is found in [Section III.C.3](#).

### **2. Mitigation**

In both the Historic and Developed FMUs, normal grounds maintenance and hazard tree removal should be adequate to mitigate the hazard from wildland fire. Prescribed fire projects along inholding boundaries and around the developed areas will provide some hazard fuel reduction.

## **XII. FIRE CRITIQUES AND ANNUAL PLAN REVIEW**

### **A. Introduction**

#### **1. Scope**

All wildland fires and fire-related incidents will be reviewed. All prescribed fires will be reviewed as appropriate.

#### **2. Reviews**

Reviews are conducted for one or more of the following purposes:

- a. To examine the progress of an on-going fire incident and to confirm effective decisions or correct deficiencies.
- b. To identify new or improved procedures, techniques or tactics.
- c. To compile consistent and complete information to improve or refine park, regional



or national fire management programs.

d. To examine anomalous fire-related incidents in order to determine cause(s), contributing factors, and where applicable, recommend corrective actions. If negligence is indicated, the circumstances will be reported and investigated in accordance with applicable regulations, policies or guidelines.

e. To determine the cost effectiveness of a fire operation.

### **3. Authority**

The authority to convene a fire review rests with the Park Superintendent, Regional Director, or the Associate Director, Park Operations and Education. It is the clear responsibility of the Superintendent to call for a review, to ensure timely completion, and to implement recommended actions. The Regional Director has responsibility to follow-up with the Superintendent, to ensure that reviews are established and completed in a timely manner, and that recommended actions are completed. The Superintendent may request technical support from Fire Management Program Center, regional, park or interagency personnel with the appropriate expertise.

### **4. Incident Types**

All wildland fire incidents which result in human entrapment, fatalities, or serious injuries, or result in incidents with potential, will be investigated and reviewed.

### **5. Associate Director**

The Associate Director, Park Operations and Education, will convene an ad-hoc team to review Service-wide fire management programs subsequent to the occurrence of any significant, controversial or unusual wildland fire management activities.

### **6. Purpose**

All reviews will be conducted as constructive critiques aimed at determining the facts related to the specific fire or fire management program. They will identify commendable actions, techniques and decisions as well as areas which need improvement. Reviews are intended to resolve operational issues, not impose punitive actions.

## **B. Fire Reviews**

### **1. "Hotline" Review**

The purpose of the hotline review is to examine the progress of an on-going fire incident, regardless of size. The review will provide a confirmation of the decisions being made daily in the Wildland Fire Situation Analysis or determine where the decision process has been faulty and corrective actions are needed.

The "hotline" review is normally conducted by the park's Fire Management Officer (or an official who has designated fire program management responsibilities) in conjunction with the incident commander on the fire.

These reviews require no special reporting. Documentation of "hotline" reviews should be included in the normal fire report narrative.

### **2. Incident Management Team (IMT) Closeout and Review**

The Park Superintendent will conduct a closeout review with the IMT prior to their release from the fire incident. The purpose of this review is to ensure complete transition of the incident management back to the park and to evaluate the status of any incomplete fire business. RM 18, Chapter 13, Exhibit 1 contains a sample Close-Out Review with Incident Management Team.

### **3. Park Level Review**

The Superintendent or his/her designated representative should conduct the park level review. The superintendent will appoint other qualified persons, including the park Fire Management Officer (or an official who has designated fire program management responsibilities) to be a part of the review. The purpose of this review is to provide the Superintendent with information to recognize commendable actions and to take needed corrective action(s). Costs associated with the review will be charged to the account assigned to the fire with the approval of the Regional Fire Management Officer. A copy of the complete report will be sent to the Regional Fire Management Officer, who will review it and, if appropriate, forward a copy to the Fire Management Program Center.

### **4. Regional Level Review**

A regional level review may be conducted for any fire that:

- a. Crosses a park's boundary into another jurisdiction without the approval of an interagency agreement.
- b. Results in adverse media attention.
- c. Involves serious injury to less than 3 personnel, significant property damage, or an incident with potential.
- d. Results in controversy involving another agency.

The regional level review normally will be conducted at the park where the fire occurred. The Regional Fire Management Officer or his/her designated representative will convene the review. Attendees will include the Superintendent of the park, park Fire Management Officer (or the official who has designated fire program management responsibilities), the incident commander(s) for the fire, and other individuals agreed upon by the Regional Director and Superintendent. If possible, the review team should visit the actual fire site as part of the review. A copy of the review report will be sent to the Fire Management Program Center. Costs associated with the review will be charged to the account assigned to the fire.

### **5. National Level Review**

A national level review may be conducted for any fire that involves Service-wide or national issues, including:

- a. Significant adverse media or political interest.
- b. Multi-regional resource response.
- c. A substantial loss of equipment or property.
- d. A fatality, or multiple, serious fire-related injuries (three or more personnel).

- e. Any other fires that the Associate Director, Park Operations and Education, wants reviewed.

The national level review normally will be conducted at the park where the fire occurred. The National Fire Management Officer or his/her designated representative will convene it. It will be attended by the Superintendent of the park, the park's Fire Management Officer (or an official who has designated fire program management responsibilities), the regional fire management officer, the incident commander(s) for the fire, and other individuals agreed upon by the National Fire Management Officer, the Regional Director and the Superintendent. If possible, the review team should visit the actual site of the fire as part of the review. All costs associated with the review will be charged to the account assigned to the fire.

An outline for final reports of fire reviews may be found in RM 18, Chapter 12, Exhibit 2. Exhibit 3 provides a checklist of sample questions, which might be asked during a fire review. These two documents should be used for park, regional and national level reviews.

#### **6. Entrapment and Fire Shelter Deployment Review**

Fire shelter deployment is defined as the use of a fire shelter for its intended purpose in any situation other than training. Use of the terms "precautionary deployment", "practice deployment" and "entrapment deployment" are not acceptable or recognized. Entrapments and fire shelter deployments will be reviewed in order to gather complete and accurate information to determine the reasons for the deployment. Corrective recommendations will be developed to minimize future situations which might lead to other shelter deployments. All entrapments and fire shelter deployments will be reported to the Regional Fire Management Officer, who will be responsible for developing the review team in cooperation with the Fire Management Program Center. The team leader will contact the Superintendent for reporting information. See RM 18, Chapter 3 for investigation and reporting requirements.

All entrapments and fire shelter deployments will be investigated as soon as possible after the deployment incident. RM 18, Chapter 13, Exhibit 4 provides specific directions for conducting an entrapment or shelter deployment review. RM 18, Chapter 13, Exhibit 5 provides an outline format for final reports on entrapment and fire shelter deployment reviews.

### **C. Program Reviews**

#### **1. Operations Evaluations**

Operations evaluations of NPS units and regions may include review of fire management programs to assure compliance with established Service standards.

#### **2. Annual Fire Program Review**

The Superintendent will convene an ad-hoc team to review park fire activity during any year in which significant, unusual or controversial fire activity occurs. This review team should analyze the reports from any reviews to determine what, if any, operational changes should be initiated. The review team will develop findings and recommendations and establish priorities for action.

#### **3. FIREPRO Review**

Annually, the FMO will conduct a FIREPRO audit and review of the park values at risk, research, equipment and project needs. The Regional/National Fire Office will conduct FIREPRO audits and Fire Program Reviews. These reviews will be completed on the schedule set by the Fire Management Program Center.

#### **4. Fire Readiness Review**

Fire readiness or preparedness reviews, utilizing the Interagency Fire Readiness Review Guide as adapted for park-specific needs, should be conducted annually prior to the established fire season by park fire management staff.

### **XIII. CONSULTATION AND COORDINATION**

The following individuals and groups were consulted during the preparation of this plan.

**Cal Gale, Natural Resource Consultant, Baldwin, WI**

**Rachel Shaw, Mangi Environmental Group**

**Rob Klein, Fire Ecologist, Ozark National Scenic Riverways**

**Angela Smith, Fire Prevention and Education Specialist, Ozark National Scenic Riverways**

**Charles Putnam, Resource Management Specialist, Ozark National Scenic Riverways**

**Victoria Grant, Resource Management Specialist, Ozark National Scenic Riverways**

**Sandy Cowin, Fire Program Assistant, Ozark National Scenic Riverways**

**Missouri Department of Conservation**

**The Nature Conservancy**

**Missouri State Historic Preservation Office**

**Cherokee Nation, Tahlequah, OK**

**United Keetoowah Band of Cherokee Indians of OK, Park Hills, OK**

**Osage Nation of OK, Pawhuska, OK**

**Delaware Tribe of Indians, Bartlesville, OK**

**Delaware Nation, Anadarko, OK**

**Eastern Shawnee Tribe of OK, Seneca, MO**

**Shawnee Tribe, Miami, OK**

**Absentee Shawnee Tribe of Indians, Shawnee, OK.**

## **XIV. APPENDICES**

### **APPENDIX A**

#### **A. References Cited**

##### **Publications:**

Agee, James K. 1994. Fire and weather disturbances in terrestrial ecosystems of the eastern Cascades. Gen. Tech. Rep. PNW-320. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 52 p.

Anderson, H.E. 1982. Aids to Determining Fuel Models for Estimating Fire Behavior. General Technical Report INT-122. Ogden, UT: Forest Service, Intermountain Forest and Range Experiment Station

Batek, Michael J., Alan Rebertus, Walter Schroeder, Timothy Haithcoat, Eric Compas, and Richard Guyette, 1999. Reconstruction of early nineteenth-century vegetation and fire regimes in the Missouri Ozarks. *Journal of Biogeography* 26; pp. 397-412.

Brown, James K., ed. 2000. Wildland fire in ecosystems: effects of fire on flora. Gen. Tech. Rep. RMRS-GTR-42-vol. 2. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Castillion, David, M. Miller and D. Swofford. 1989. Ecological Landtype Maps. - Ozark National Scenic Riverways. National Park Service. 50pp.

Deeming, J.E.; Burgan, R.L.; Cohen, J.D. 1977. The National Fire Danger Rating System -1978. General Technical Report INT-39. Ogden, UT: Forest Service, Intermountain Forest and Range Experiment Station

Ford-Robertson, F. C. 1971. Terminology of forest science technology practice and products. Washington, DC: Society of American Foresters. 370 p.

Guyette, R.G. and McGuinness, E.A. 1982. Fire history of an Ozark glade in Missouri. *Transactions of the Missouri Academy of Science* 16:85-93.

Guyette, Richard and Bruce Cutter, 1991. Tree-ring analysis of fire history of a post oak savanna in the Missouri Ozarks. *Natural Areas J.* Vol. 11(2), pp. 94-99.

Guyette, Richard and Bruce Cutter, 1992. Fire history at two sites on the Mark Twain National Forest. A report prepared for the Mark Twain National Forest (unpublished). Rolla, Mo., under Challenge Cost Share Agreement No. 09-05-121 21pp.

Guyette, Richard, 1993. Progress Report on Fire history of rhyolite and dolomite glades. Report period July 1, 1992 to May 23, 1993.

Guyette, Richard, 1995. A tree-ring history of wildland fire in the Current River watershed. A report to the Missouri Department of Conservation, the Ozark National Scenic Riverways, and the National Park Service Climate Change Program. University of Missouri, Columbia, MO. 74 pp.

Guyette, Richard, Bruce E. Cutter, 1997. Fire history, population, and calcium cycling in the Current River watershed. Pp. 354-372 in Stephen G. Pallardy, et al. (eds.) 11<sup>th</sup> Central

**Hardwood Forest Conference. Proceedings of a meeting held at the University of Missouri, Columbia, MO March 23-26, 1997. GTR-NC-188. St. Paul, MN: USDA Forest Service, North Central Forest Experiment Station.**

**Jensen, Randel G. Management of Savanna-Shrub Openings for Wildlife in Missouri's Ozark Forest. National Wild Turkey Federation, Love Fellowship. December 1992.**

**Johnson, E. A.; Van Wagner, C. E. 1985. The theory and use of two fire history models. Canadian Journal of Forest Research 15: 214-220.**

**Ladd, D. 1988. Missouri Oak Woodlands: a management challenge. Proceeding Missouri Oak Woodland Management Symposium. University of Missouri - Columbia.**

**Ladd, D. 1991. Reexamination of the Role of Fire in Missouri Oak Woodlands. Proceedings of the Oak Woods Management Workshop. Eastern Illinois University, Charleston, IL. 1991.**

**Menakis, Jim, 2000. P.7 in James K. Brown and Jane Kepler Smith (eds.). Wildland Fire in Ecosystems: Effects of Fire on Flora. Gen. Tech. Rep. RMRS-GTR-42-vol.2. Ogden, UT: US Department of Agriculture, Forest Service, Rocky Mountain Research Station. 257p.**

**McPherson, G.; Wade, E.; Phillips, C. B. 1990. Glossary of wildland fire management terms. Bethesda, MD: Society of American Foresters.**

**Mutch, Robert W. 1992. Sustaining forest health to benefit people, property, and natural resources. In: American forestry -- an evolving tradition, proceedings of the 1992 Society of American Foresters National Convention; 1992 October 25-27; Richmond, VA. Bethesda, MD: Society of American Foresters: 126-131.**

**National Park Service. 1994. Fire Management Plan. Ozark National Scenic Riverways. Van Buren, Missouri.**

**National Park Service. 1995. Resource Management Plan, Ozark National Scenic Riverways. Van Buren, Missouri.**

**National Park Service, 2001, NPS Management Policies, Chapter 4 Natural Resource Management**

**National Park Service, 2001, RM-18: Wildland Fire Management.**

**National Park Service, 2001, Fire Monitoring Handbook.**

**National Park Service; USDA Forest Service; Bureau of Indian Affairs; U.S. Fish and Wildlife Service; Bureau of Land Management. 1998. Wildland prescribed fire management policy: Implementation procedures reference guide. Boise, ID: U.S. Department of the Interior, National Park Service, National Interagency Fire Center. 78 p.**

**National Wildfire Coordinating Group (NWCG). 1995. Glossary of wildland fire terminology. Boise, ID: National Interagency Fire Center, National Fire and Aviation Support Group.**

**Nigh, T. 1988. Missouri Natural Features Inventory: Carter Co., Oregon Co., Ripley Co., Shannon Co. Missouri Department of Natural Resources, Jefferson City, Missouri 286p.**

**NWCG, 2000. Wildland and Prescribed Fire Qualifications System Guide, 310-1**

**Petrides, George A. 1972 A Field Guide to Trees and Shrubs. The Peterson Field Guide Series,**

Redfearn, Paul L., 1969. Botanical survey of the Ozark National Scenic Riverways. Prepared for the National Park Service. Department of Life Sciences, Southwest Missouri State College, Springfield, Missouri. 325p.

Reiter, Susan R., 1991. Woody invasion onto glades of the Ozark National Scenic Riverways, Missouri. Masters Thesis. Iowa State University. 80pp.

Rothermel, R.C. 1983. How to Predict the Behavior of Forest and Range Fires. General Technical Report INT-143. Ogden, UT: Forest. Service, Intermountain Forest and Range Experiment Station

Rowe, J. S. 1983. Concepts of fire effects on plant individuals and species. In: Wein, Ross W.; MacLean, David A., editors. The role of fire in northern circumpolar ecosystems. New York: John Wiley and Sons: 135-154.

Schoolcraft, Henry R., 1821. Journal of a Tour into the Interior of Missouri and Arkansaw(sic)...Performed in the Year 1818 and 1819. Richard Philips and Co., London.

Smith, Jane Kapler, ed. 2000. Wildland fire in ecosystems: effects of fire on fauna. Gen. Tech. Rep. RMRS-GTR-42-vol. 1. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Southern Forest Fire Laboratory Staff. 1976. Southern Forestry Smoke Management Guidebook, USDA Forest Service , General Technical Report SE-10, Asheville, NC, Southeast Forest Experiment Station

Templeton, Alan R., Robert J. Robertson, Jennifer Brisson, and Jared Strasburg. 2001. Disrupting evolutionary processes: the effect of habitat fragmentation on collared lizards in the Missouri Ozarks. Proceedings of the National Academy of sciences. Vol. 98, No. 10, 5426-5432.

Ver Hoef, Jay M., Glenn-Lewin, David C. and Reiter, Susan R., 1992. Glades of the Ozark National Scenic Riverways, Missouri. Department of Botany, Iowa State University. A report to the National Park Service. Contract Number CA6640-8-8008.

Vineyard, Jerry D. 1969. Geologic report on the Ozark National Scenic Riverways. Missouri Geological Survey 55pp.

#### Internet Reference Sites:

2001 Federal Fire Policy Review ([http://www.nifc.gov/fire\\_policy/index.htm](http://www.nifc.gov/fire_policy/index.htm))

Clean Air Act (PL 88-206, as amended), ([http://www.epa.gov/oar/oaq\\_caa.html](http://www.epa.gov/oar/oaq_caa.html))

Common names of plants found at (<http://plantsdatabase.com/>)

Cultural Resource Management references  
(<http://archnet.asu.edu/archnet/topical/crm/crmusdoc.html>)

Endangered Species Act of 1973 (<http://endangered.fws.gov/esa.html>)

Fire Effects Information System for common names of plants found at (<http://www.fs.fed.us/database/feis/>)

Flora and Fauna Species Database (<http://ice.ucdavis.edu/nps/sbypark.html>)

National Environmental Policy Act (NEPA)  
(<http://www4.law.cornell.edu/uscode/42/ch55.html#PC55>)

National Fire Plan (<http://www.fireplan.gov/>)

National Historic Preservation Act (<http://www4.law.cornell.edu/uscode/16/470.html>)

National Park Service DO-18, Wildland Fire Management  
(<http://www.nps.gov/fire/fire/policy/do18/do18.htm>)

National Park Service RM-18, Wildland Fire Management  
(<http://www.nps.gov/fire/fire/policy/rm18/index.htm>)

U.S. Department of Agriculture Plants Database for plant information and common names at (<http://plants.usda.gov/>)

U.S. Department of Agriculture/U.S. Department of Interior, 2001 Federal Fire Management Policy update. The full text of the policy, Secretarial Transmittals, and Appendices may be found at (<http://www.nps.gov/fire/fire/policy/rm18/index.htm>).

U.S. Department of Interior, Departmental Manual, 620 DM 1.1,  
(<http://elips.doi.gov/elips/release/3203.htm>)

U.S. Geological Survey, Northern Prairie Research Center herbarium listing for common names of plants at (<http://www.pwrc.usgs.gov/history/herbarium/category.htm>)

University of Wisconsin Herbarium for common names of plants at (<http://wiscinfo.doit.wisc.edu/herbarium/>)

## **APPENDIX B**

### **B. Definitions**

A consistent list of terms and their definitions has been developed and approved by the NWCG. This list of defined terms includes terms obsolete under the new policy. Additional terms used in this reference guide but not defined by NWCG are from the Fire Effects Information System and other sources. The sources may be found in the References Cited (Appendix A).

**Appropriate Management Response** – Specific actions taken in response to a wildland fire to implement protection and fire use objectives. This term is a new term that does not replace any previously used term.

**Burning Index - (BI)** A number related to the contribution that fire behavior makes to the amount or effort needed to contain a fire in a particular fuel type within a rating area. An Index for describing Fire Danger.



**Climax** – A biotic community that is in equilibrium with existing environmental conditions and represents the terminal stage of an ecological succession (Smith 2000).

**Crown Fire** – Fire that burns in the crowns of trees and shrubs. Usually ignited by a surface fire. Crown fires are common in coniferous forests and chaparral-type shrublands (Brown 2000).

**Duff** – Partially decomposed organic matter lying beneath the litter layer and above the mineral soil. Includes the fermentation and humus layers of the forest floor (O2 soil horizon) (Brown 2000).

**Ecosystem** – An interacting system of interdependent organisms.

**Fire Exclusion** – The policy of suppressing all wildland fires in an area (Smith 2000).

**Fire Frequency** – Number of fires per year in a specified area (McPherson and others 1990).

**Fire Management Plan (FMP)** – A strategic plan that defines a program to manage wildland and prescribed fires and documents the Fire Management Program in the approved land use plan. The plan is supplemented by operational plans such as preparedness plans, preplanned dispatch plans, prescribed fire plans and prevention plans.

**Fire Management Unit (FMU)** – Any land management area definable by objectives, topographic features, access, values-to-be-protected, political boundaries, fuel types, or major fire regimes, etc., that sets it apart from management characteristics of an adjacent unit. FMU's are delineated in Fire Management Plans (FMP). These units may have dominant management objectives and pre-selected strategies assigned to accomplish these objectives.

**Fire Regime** – Describes the patterns of fire occurrence, size, and severity - and sometimes, vegetation and fire effects as well - in a given area or ecosystem (Agee 1994, Mutch 1992, Johnson and Van Wagner 1985). A fire regime is a generalization based on fire histories at individual sites. Fire regimes can often be described as cycles because some parts of the histories usually get repeated, and the repetitions can be counted and measured. The fire regime on a particular kind of site or in a particular ecosystem is not cyclic in a deterministic sense; it is, rather, a story about climate, human use, other disturbance, and species dispersion as they have all changed and interacted to affect an ecosystem, both suddenly and subtly, over millennia. The concept of fire regime as story lets us think about the future in that type or ecosystem as a question, perhaps a choice, rather than a destiny. According to Agee (1994), "A fire regime is a generalized way of integrating various fire characteristics. The organization may be according to the characteristics of the disturbance..., dominant or potential (climax) vegetation on the site..., or fire severity, the magnitude of effects on dominant vegetation...." According to Mutch (1992), "A natural fire regime is the total pattern of fires over time that is characteristic of a natural region or ecosystem. The classification of fire regimes includes variations in ignition, fire intensity and behavior, typical fire size, fire return intervals, and ecological effects." According to Johnson and Van Wagner (1985), "... fire regime is a multivariate system characterized by (i) the fire history measured in fire frequency or fire return period, (ii) fire intensity measured in kW/m, and (iii) depth of burn (duff removed) measured in kg/m, or percent...."

**Fireline Intensity** – The rate of heat release per unit time per unit length of fire front. Numerically, the product of the heat of combustion, quantity of fuel consumed per unit area in the fire front, and the rate of spread of a fire, expressed in KW/m (McPerson and others 1990).

**Flame Length** – The length of flames in a fire front measured along the slant of the flame, from the midpoint of its base to its tip. Flame length is mathematically related to fireline intensity

and tree crown scorch height (Brown 2000).

**FMO – Fire Management Officer.**

**Fuel – Fuel is comprised of living and dead vegetation that can be ignited. It is often classified as dead or alive and as natural fuels or activity fuels (resulting from human actions, usually from logging operations). Fuel components refer to such items as downed dead woody material by various size classes, litter, duff, herbaceous vegetation, live foliage etc. (Brown 2000).**

**Fuel Loading – The weight per unit area of fuel, often expressed in tons per acre or tones per hectare. Dead woody fuel loadings are commonly described for small material in diameter classes of 0 to 1/4-, 1/4 to 1-, and 1 to 3-inches and for large material in one class greater than 3 inches (Brown 2000).**

**Fuel Moisture – percent or fraction of oven dry weight of fuel. It is the most important fuel property controlling flammability. In living plants it is physiologically bound. Its daily fluctuations vary considerably by species but are usually above 80 to 100%. As plants mature, moisture content decreases. When herbaceous plants cure, their moisture content responds as dead fuel moisture content, which fluctuates according to changes in temperature, humidity, and precipitation (Brown 2000).**

**FWS – U.S. Fish and Wildlife Service, Department of the Interior.**

**GIS – Geographic Information System**

**GMP – General Management Plan. A park document that describes broad management goals and objectives for NPS units.**

**GPS – Geographic Positioning System**

**Hazard Fuel – A fuel complex that, by nature, presents a hazard to socio-politico-economic interests when ignited. The hazard fuel condition can be mitigated through hazard fuel reduction.**

**Hazardous fuels – Those vegetative fuels which, when ignited, threaten: public safety, structures and facilities, cultural resources, natural resources, and/or natural processes. Also: fuels that permit the spread of wildland fires across administrative boundaries except as authorized by agreement, and fuel accumulations and arrangement may be within the natural range of variability and still be hazardous because of the proximity to values at risk.**

**Initial Attack – The first aggressive suppression action taken on a fire, consistent with firefighter and public safety, and values to be protected.**

**Initial Attack Incident Commander – Leader of first response fire suppression forces.**

**Litter – The top layer of the forest floor (01 soil horizon); includes freshly fallen leaves, needles, fine twigs, bark flakes, fruits, matted dead grass and other vegetative parts that are little altered by decomposition. Litter also accumulates beneath rangeland shrubs. Some surface feather moss and lichens are considered to be litter because their moisture response is similar to that of dead fine fuel.**

**Mitigation – Mitigation consists of on-the-ground activities that serve to check, direct, or delay the spread of fire; and minimize threats to life, property, and resources. Actions may include mechanical and physical non-fire tasks, specific fire applications, and limited suppression actions. These actions will be used to construct firelines, reduce excessive fuel**

concentrations, reduce vertical fuel continuity, create fuel breaks or barriers around critical or sensitive sites or resources, create "blacklines" through controlled burnouts, and to limit fire spread and behavior.

**National Fire Danger Rating System (NFDRS)** – A widely used system to predict several measures of fire probability and resistance to control.

**National Fire Plan** – A plan prepared by agencies of the U.S. Departments of Agriculture and Interior to reduce adverse effect from unwanted wildland fires.

**NFFL Model (Northern Forest Fire Laboratory Model)** – One of the thirteen fuel models used to predict fire behavior using the fire spread formulas developed by Rothermel (1972).

**NPS** – National Park Service, Department of the Interior.

**Preparedness** – Activities that lead to a safe, efficient and cost effective fire management program in support of land and resource management objectives through appropriate planning and coordination. This term replaces presuppression.

**Prescribed Fire** – Any fire ignited by management actions to meet specific objectives. Prior to ignition, a written, approved prescribed fire plan must exist, and National Environmental Protection Act requirements must be met. This term replaces management ignited prescribed fire.

**Presettlement Fire Regime** – The time from about 1500 to the mid- to late-1800s, a period when Native American populations had already been heavily impacted by European presence and before extensive settlement by European Americans in most parts of North America, before extensive conversion of wildlands for agricultural and other purposes, and before fires were effectively suppressed in many areas (Smith 2000).

**Prescribed Fire Plan** – A plan required for each fire application ignited by managers. It must be prepared by qualified personnel and approved by the appropriate Agency Administrator prior to implementation. Each plan will follow specific agency direction and must include critical elements described in agency manuals. Formats for plan development vary among agencies, although the content is identical.

**Prescribed Fire Specialist** – The staff specialist with primary duties of managing both the prescribed fire and Wildland Fire Used for Resource Benefit (where applicable) programs.

**Prescription** – Measurable criteria which define conditions under which a prescribed fire may be ignited, guide selection of appropriate management responses, and indicate other required actions. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social or legal considerations.

**Relict** – A biotic community or fragment of a community that has survived some important change, often to become in appearance an integral part of existing vegetation.

**Resource Management Plan (RMP)** – Park planning document that describes resource management goals and objectives for NPS units.

**Snag** – A standing dead tree from which the leaves and some of the branches have fallen (Smith 2000).

**Succession** – The gradual, somewhat predictable process of community change and replacement leading toward a climax community; the process of continuous colonization and

extinction of populations at a particular site (Smith 2000).

Suppression – see Wildland Fire Suppression

T&E – Threatened and Endangered plants and animals. Also referred to as listed species.

Top-Kill – Kills aboveground tissues of plant without killing underground parts from which the plant can produce new stems and leaves (Smith 2000).

USFS – United States Forest Service

Wildland Fire – Any non-structure fire, other than prescribed fire, that occurs in the wildland. This term encompasses fires previously called both wildfires and prescribed natural fires.

Wildland Fire Management Program – The full range of activities and functions necessary for planning, preparedness, emergency suppression operations, and emergency rehabilitation of wildland fires, and prescribed fire operations, including non-activity fuels management to reduce risks to public safety and to restore and sustain ecosystem health.

Wildland Fire Situation Analysis (WFSA) – The decision-making process that evaluates alternative management strategies against selected safety, environmental, social, economic, political, and resource management objectives.

Wildland Fire Suppression – An appropriate management response to wildland fire that results in curtailment of fire spread and eliminates all identified threats from the particular fire. All wildland fire suppression activities provide for firefighter and public safety as the highest consideration, but minimize loss of resource values, economic expenditures, and/or the use of critical firefighting resources.

Wildland Fire Use – The management of naturally-ignited wildland fires to accomplish specific, pre-stated, resource management objectives in pre-defined geographic areas outlined in Fire Management Plans. Operational management is described in the Wildland Fire Implementation Plan (WFIP). Wildland fire use is not to be confused with "fire use," a broader term encompassing more than just wildland fires.

Wildland Urban Interface – Structures (homes, offices, and other developments) located in wildland fuel complexes.

## APPENDIX C

### C. Species List

Table 9 – Federal Threatened or Endangered Species

Common Name	Accepted Scientific Name
Gray Bat	<i>Myotis grisescens</i>
Indiana Bat	<i>Myotis sodalis</i>
Swainson's Warbler	<i>Limnothlypsis swainsonsi</i>

<b>Bald Eagle</b>	<i>Haliaeetus leucocephalus</i>
<b>Ozark hellbender (candidate)</b>	<i>Cryptobranchus alleganiensis bishopi</i>

## APPENDIX D

### D. NEPA and Other Compliance

#### 1. EA FONSI

#### 2. SHPO – NHPA consultation

1. FWS Section 7 Consultation
2. Native American Tribal Consultation

The park archaeologist discussed the proposed undertakings with each tribe (*see section XIII. Consultation and Coordination*) and sent a letter and a draft copy of this plan to each tribe under the Superintendent's signature. These letters went out on Feb. 5, 2003. The park received only one response, from Anthony P. Whitehorn, Tribal Enterprise Manager, Osage Tribal Council, Pawhuska, OK. In this letter Mr. Whitehorn stated that if any activities should expose Osage archeological materials, such as bone, pottery, chipped stone, etc., activities should cease, and his office should be contacted so that an evaluation can be made. The park's position that in addition to improving habitat for certain species, fire management described in this plan will return selected areas to their appearance similar to that enjoyed by Native Americans prior to the arrival of Euro-Americans in the Current River and Jacks Fork drainages.

## APPENDIX E

### A. Annual Revision Documents

#### 1. Fire Call-up List

## APPENDIX E

#### 2. Preparedness Inventory

Table 10 – Big Spring Cache Inventory

<b>Big Spring Fire Cache</b>
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<u>Item</u>	<u>Size</u>	<u>Quantity</u>
Gated Wye		3
1 1/2" Nozzle		2
Fog Nozzle		1
1 1/2" Brass Nozzle		3
1 1/2" Plastic Nozzles		2
1" Plastic Nozzles		2
3/4" GHT		1
Strainer Cap (damaged)		1
1 1/2" Suction Strainer		1
1/2" Hose Gaskets		1 Bag
1 1/2" Hose Gaskets		1 Bag
3/4" Brass Nozzle		1
1" Gated Valve		2
Spanner Wrench		1
Hydrant Wrench		1
Tool Wedges		3
Water Bag Nozzles		2 Bags
4 Volt Search Lights		2
1 1/2" Foam Nozzles		1
Female Quick Connects For Water Bags		1/2 Box
1" Wyes		4
MRE's		Full Box +
Water Bottles		70
Canteen w/straps	4 quart	1
Yellow Hard Hats (regular)		9

<b>Yellow Hard Hats (wide brim)</b>		<b>1</b>
<b>White Hard Hats (wide brim)</b>		<b>2</b>
<b>Chin Straps</b>		<b>4</b>
<b>Hard Hat Head Bands</b>		<b>5</b>
<b>Dust Goggles</b>		<b>2</b>
<b>Goggle Lenses</b>		<b>8</b>
<b>Head Lamps (working)</b>		<b>10</b>
<b>Head Lamps (not-working)</b>		<b>2</b>
<b>Nomex Shrouds</b>		<b>6</b>
<b>Brush Jackets</b>	<b>S</b>	<b>3</b>
<b>Brush Jackets</b>	<b>M</b>	<b>1</b>
<b>Nomex Shirts (new)</b>	<b>M/L</b>	<b>6</b>
<b>Nomex Shirts</b>	<b>L</b>	<b>5</b>
<b>Nomex Shirts</b>	<b>S</b>	<b>5</b>
<b>Nomex Shirts</b>	<b>XL</b>	<b>4</b>
<b>Nomex Shirts</b>	<b>XL/L</b>	<b>1</b>
<b>Nomex Shirts</b>	<b>M</b>	<b>2</b>
<b>Nomex Shirts (older)</b>	<b>M</b>	<b>4</b>
<b>Nomex Pants (BDU)</b>	<b>26-30x30</b>	<b>5</b>
<b>Nomex Pants (BDU)</b>	<b>28-32x29</b>	<b>2</b>
<b>Nomex Pants (BDU)</b>	<b>28-32x34</b>	<b>4</b>
<b>Nomex Pants (BDU)</b>	<b>30-34x33</b>	<b>8</b>
<b>Nomex Pants (BDU)</b>	<b>32-36x34</b>	<b>5</b>
<b>Nomex Pants (BDU)</b>	<b>34-38x34</b>	<b>2</b>
<b>Nomex Pants (BDU)</b>	<b>36-40x34</b>	<b>2</b>
<b>Nomex Pants (BDU)</b>	<b>32-36x30</b>	<b>2</b>
<b>Nomex Pants (BDU)</b>	<b>30-34x30</b>	<b>1</b>

<b>Nomex Pants (BDU)</b>	<b>28-32x29</b>	<b>1</b>
<b>Nomex Pants (BDU)</b>	<b>34-38x33</b>	<b>1</b>
<b>Nomex Pants (BDU)</b>	<b>28-32x33</b>	<b>1</b>
<b>Nomex Pants (BDU)</b>	<b>32-36x34</b>	<b>1</b>
<b>Nomex Pants (older)</b>	<b>32x34</b>	<b>11</b>
<b>Nomex Pants (older)</b>	<b>32</b>	<b>1</b>
<b>Nomex Pants (older)</b>	<b>34x30</b>	<b>7</b>
<b>Nomex Pants (older)</b>	<b>34x34</b>	<b>2</b>
<b>Nomex Pants (older)</b>	<b>34</b>	<b>1</b>
<b>Nomex Pants (older)</b>	<b>36x34</b>	<b>1</b>
<b>Nomex Pants (older)</b>	<b>38x30</b>	<b>2</b>
<b>Nomex Pants (older)</b>	<b>38x34</b>	<b>3</b>
<b>Nomex Pants (older)</b>	<b>40x30</b>	<b>1</b>
<b>Leather Gloves</b>	<b>XL</b>	<b>9</b>
<b>Leather Gloves</b>	<b>L</b>	<b>2</b>
<b>Leather Gloves</b>	<b>M</b>	<b>8</b>
<b>Leather Gloves</b>	<b>S</b>	<b>5</b>
<b>Leather Gloves (misc. pairs)</b>		<b>7</b>
<b>Yellow Packs (complete)</b>		<b>5</b>
<b>Yellow Packs (incomplete)</b>		<b>2</b>
<b>Yellow Butt Packs</b>		<b>3</b>
<b>Yellow Shoulder Harnesses</b>		<b>4</b>
<b>Web Belts (yellow)</b>		<b>2</b>
<b>Fire Shelter</b>		<b>15</b>
<b>Fire Shelter (practice)</b>		<b>7</b>
<b>Eagle Pack Parts (red) (belt, pouches)</b>		
<b>Yellow Shelter Pouches</b>		<b>10</b>



<b>Yellow Canteen Pouches</b>		<b>4</b>
<b>White Canteen Pouches</b>		<b>24</b>
<b>Red Pouches (misc.) (I.A.)</b>		<b>8</b>
<b>Black Pouches (misc.) (I.A.)</b>		<b>2</b>
<b>Green Pouches (misc.) (I.A.)</b>		<b>3</b>
<b>Red Bag</b>	<b>L</b>	<b>1</b>
<b>Ear Plugs</b>	<b>Box of 50</b>	<b>4</b>
<b>Safety Glasses (clear)</b>		<b>12</b>
<b>Safety Glasses (mirror)</b>		<b>14</b>
<b>Flagging (Killer Tree)</b>		<b>6</b>
<b>Flagging (Spot Fire)</b>		<b>7</b>
<b>Flagging (pink)</b>		<b>5</b>
<b>Flagging (lime green)</b>		<b>2</b>
<b>Flagging (red)</b>		<b>3</b>
<b>Flagging (blue)</b>		<b>5</b>
<b>Flagging (orange)</b>		<b>2</b>
<b>Flagging (red/white)</b>		<b>3</b>
<b>Compasses (silver)</b>		<b>2</b>
<b>1st Aid Kit (military)</b>		<b>1</b>
<b>1st Aid Kit (Type 4 FSS)</b>		<b>1</b>
<b>Clam Shell</b>		<b>1</b>
<b>Sleeping Mats</b>		<b>2</b>
<b>Flare Pistol (w/case, belt, holster)</b>		<b>1</b>
<b>1 1/2" Hose (orange)</b>	<b>50'</b>	<b>5</b>
<b>1 1/2" Hose (white)</b>	<b>50'</b>	<b>1</b>
<b>1 1/2" Hose (white)</b>	<b>100'</b>	<b>2</b>
<b>Parachute Cord</b>	<b>roll</b>	<b>2</b>

<b>Foam Buckets (concentrate)</b>		<b>3</b>
<b>Mark III Kit</b>		<b>1</b>
<b>Spanner</b>		<b>1</b>
<b>IA Pack</b>		<b>1</b>
<b>1 1/2" Gated Wye</b>		<b>1</b>
<b>Acc. Kit</b>		<b>1</b>
<b>1 1/2" Reducer</b>		<b>1</b>
<b>1 1/2" Nozzle</b>		<b>1</b>
<b>1 1/2" Female Coupling</b>		<b>1</b>
<b>1 1/2" Male Coupling</b>		<b>1</b>
<b>1 1/2" Aluminum Reducer</b>		<b>1</b>
<b>Forester Nozzle</b>		<b>1</b>
<b>Saw Pack</b>		<b>1</b>
<b>Hard Hat w/muffs</b>		<b>1</b>
<b>Chaps (regular/old)</b>		<b>2</b>
<b>Wedges</b>	<b>long</b>	<b>2</b>
<b>Wedges</b>	<b>med</b>	<b>2</b>
<b>Gloves</b>	<b>L</b>	<b>1</b>
<b>Goggles</b>		<b>1</b>
<b>Round Files</b>		<b>3</b>
<b>Bastard File</b>	<b>S</b>	<b>1</b>
<b>Chaps (regular/old)</b>		<b>1</b>
<b>Pressure Gauge WAJAX (w/wooden box)</b>		<b>1</b>
<b>File Handles</b>	<b>Large</b>	<b>1 box</b>
<b>Water Cans (metal)</b>		<b>2</b>
<b>Brush Hooks</b>		<b>2</b>
<b>Council Rakes</b>		<b>6</b>

Bow Saw		1
Double-Bit Axes		9
Shovels		2
Single-Bit Axes		2
Boy's Axe		1
McClouds		1
Pulaski		1
Aluminum Rakes		2
Sledge Hammer		1

## APPENDIX E

### 3. Cooperative Agreements

[Table 8](#) lists current fire related agreements. Agreements are found on the following pages. The Mark Twain Agreement will be added to this appendix when revised.

## APPENDIX E

### MEMORANDUM OF UNDERSTANDING

Between

NATIONAL PARK SERVICE

(OZARK NATIONAL SCENIC RIVERWAYS)

and

VAN BUREN FIRE DEPARTMENT

The Memorandum of Understanding is entered into between the VAN BUREN FIRE DEPARTMENT, acting through and by the Chief of the Department, hereinafter referred to as VAN BUREN and the NATIONAL PARK SERVICE, acting through and by the Superintendent, Ozark National Scenic Riverways (OZAR), hereinafter referred to as Ozark.

#### **AUTHORITY**

The Act of May 27, 1955, at seq., 42 U.S.C. § 1856 (a) and 16 U.S.C. §§ 1b (1) and 1b (8) authorize agencies of the United States to enter into agreements with other fire protection organizations to render emergency fire fighting and mutual assistance in the suppression of fires.

#### **PURPOSE**

The purpose of this agreement is to establish the terms and conditions under which the NATIONAL PARK SERVICE, OZARK NATIONAL SCENIC RIVERWAYS, and the VAN BUREN FIRE DEPARTMENT will furnish supplies and materials and/or assistance to each other in suppressing structural fires and wildfires. The rural area surrounding the VAN BUREN community in Carter County, Missouri, and the federal properties and developments located in and around Big Spring and Van Buren.

Now THEREFORE, the parties to hereby agree as follows:

#### **FIRES ON PARK ADMINISTERED LANDS:**

##### **VAN BUREN AGREES TO:**

- A. Be the primary responder for all structural fires, vehicle fires, and vehicle accident extrications. OZARK will provide a representative to coordinate with VAN BUREN on all emergency services rendered on park lands.
- B. Respond to and engage in the immediate containment and suppression of all structural fires in the park.
- C. Respond to requests from OZARK to supply fire engines, water tenders/tankers, water and personnel and otherwise assist in wildland fire suppression and structural protection from wildland fire within the park.

##### **OZARK AGREES TO:**

- A. Provide initial fire extinguisher response to all structural fires and vehicle fires on OZARK lands.
- B. Cooperate and coordinate with VAN BUREN command personnel in facilitating VAN BUREN's suppression of structural fires on OZARK lands.
- C. Allow VAN BUREN to use OZARK hydrants and water resources for fighting fires.

#### **FOR WILDLAND FIRES OUTSIDE THE PARK:**

OZARK agrees to respond with qualified personnel and with equipment to any wildfire outside the park, but within the geographical area, at the request of the Missouri Department of Conservation. OZARK response will be in accordance with federal wildland fire policies and procedures.

#### **APPENDIX E**

##### **OZARK AND VAN BUREN MUTUALLY AGREE TO THE FOLLOWING:**

- A. Employee/volunteers of the VAN BUREN FIRE DEPARTMENT are not considered employees of OZARK.
- B. VAN BUREN specifically waives reimbursement for any cost incurred in fighting fires in the park, pursuant to this agreement.
- C. The obligations of OZARK under this agreement are contingent upon the appropriation of funds created by Congress for this purpose.
- D. OZARK and VAN BUREN waive all claims against each other for compensation for any loss, damage, personal injury or death occurring during activities under this agreement.
- E. OZARK AND VAN BUREN agree to manage any structural fire within the park or other mutual aid incident under the Incident Command System (ICS).
- F. OZARK AND VAN BUREN agree to cooperate on fire investigations, incident reporting, and the sharing of information on fires in the mutual aid area.

**TERM OF THE AGREEMENT:**

The term of this agreement is five (5) years. OZARK and VAN BUREN will jointly review the results of the agreement at the end of each calendar year.

**KEY OFFICIALS:**

The Park Superintendent has the authority and responsibility for managing this agreement on behalf of OZARK, assisted by the Fire Management Officer (FMO).

The Fire Chief, VAN BUREN FIRE DEPARTMENT, has the authority and responsibility for managing this agreement on behalf of the city of VAN BUREN.

**REQUIRED CLAUSES:**

- A. No member or delegate to Congress, or resident Commissioner, shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.
- B. During the performance of this agreement, the participants agree to abide by the terms of Executive Order 11246 on non-discrimination and will not discriminate against any person because of race, color, religion, sex, or national origin. The participants will take affirmative action to ensure that applicants are employed without regard to their race, color, religion, sex, or national origin.

Dated this \_\_\_\_20\_\_\_\_ day of \_\_March\_\_\_\_, 2002.

**Superintendent**

**Ozark National Scenic Riverways**

**Fire Chief**

**VAN BUREN Fire Department**

**APPENDIX E**

**MEMORANDUM OF UNDERSTANDING**

**Between**

**NATIONAL PARK SERVICE**

**(OZARK NATIONAL SCENIC RIVERWAYS)**

**and**

**TIMBER RURAL FIRE DEPARTMENT**

The Memorandum of Understanding is entered into between the TIMBER COMMUNITY FIRE PROTECTION DISTRICT, acting through and by the president and Chief of the Department, hereinafter referred to as TIMBER and the NATIONAL PARK SERVICE, acting through and by the Superintendent, Ozark National Scenic Riverways (OZAR), hereinafter referred to as Ozark.

**AUTHORITY**

The Act of May 27, 1955, at seq., 42 U.S.C. § 1856 (a) and 16 U.S.C. §§ 1b (1) and 1b (8) authorize agencies of the United States to enter into agreements with other fire protection organizations to render emergency fire fighting and mutual assistance in the suppression of fires.

**PURPOSE**

The purpose of this agreement is to establish the terms and conditions under which the NATIONAL PARK SERVICE, OZARK NATIONAL SCENIC RIVERWAYS, and the TIMBER COMMUNITY FIRE PROTECTION DISTRICT will furnish supplies and materials and/or assistance to each other in suppressing structural fires and wildfires. The rural area surrounding the TIMBER community in Shannon County, Missouri, and the federal properties and developments located in and around Akers Ferry, Pulltite, and Round Spring will be benefited by the agreement.

Now THEREFORE, the parties to hereby agree as follows:

1. the previous agreement, OZARK agreed to furnish one fire engine to TIMBER for their use in structural fire fighting in the TIMBER area of fire suppression responsibility, including OZAR. The engine included hose, fittings, and other fire fighting items. Following transfer of the loaned equipment, OZARK accepted no responsibility for the loaned equipment, nor warranted that the equipment supplied with the engine was satisfactory for accomplishment if the intended purpose. TIMBER was and is responsible for inspecting, performing repairs, and obtaining licensing of any equipment supplied by OZARK. That engine was provided by OZARK, and the agreement regarding it remains.

2. the event that TIMBER determines during the term of this agreement to discontinue use of the engine for any reason, or upon expiration of this agreement, the engine will be returned to OZARK in as good condition as when delivered, less normal wear and tear.

3. Should TIMBER decide not to use any of the equipment, or to replace it, the equipment will be returned to OZARK in as good condition as when delivered, less normal wear and tear.

4. TIMBER agrees to provide proper vehicle maintenance and servicing (lubrication and oil) for the fire engine, and keep it in a state of readiness. TIMBER agrees to repair any mechanical problems including replacement of worn and damaged parts at no cost to OZARK. TIMBER agrees to store the fire engine in an enclosed, heated structure.

5. TIMBER agrees to maintain and service the accompanying fittings and hoses, at no cost to OZARK.

6. TIMBER will permit OZARK or an agent of OZARK to inspect all equipment and gear once a year, or whenever a problem is reported with said equipment or gear. If the equipment inspected is found to be in abnormal disrepair, shows evidence of abuse and/or not being maintained to commonly accepted standards, OZARK shall remove the equipment from TIMBER until such time that the problem can be rectified to the satisfaction of both parties.

## **APPENDIX E**

7. TIMBER agrees to maintain third party liability, comprehensive and collision insurance to protect National Park Service, OZARK, the engine, and equipment loaned to TIMBER for performance under this agreement. TIMBER will provide copies of insurance policies or certificates of insurance to OZARK. TIMBER also agrees to notify OZARK within 5 days of any change in insurance coverage including cancellation of policies.

8. OZARK assumes no responsibility for operation or maintenance of the property and equipment loaned to TIMBER. Further, neither the United States nor any of its employees will assume liability for any deficiencies in the operation, maintenance or performance of such equipment.

9. TIMBER shall be responsible for replacing or repairing the engine and other equipment that is destroyed, lost, or damaged beyond repair due to negligence or misuse.

### **FIRES ON PARK ADMINISTERED LANDS:**

#### **TIMBER AGREES TO:**

A. Be the primary responder for all structural fires, vehicle fires, and vehicle accident extrications. OZARK will provide a representative to coordinate with TIMBER on all emergency services rendered on park lands.

B. Respond to and engage in the immediate containment and suppression of all structural fires in the park.

C. Respond to requests from OZARK to supply fire engines, water tenders/tankers, water and personnel and otherwise assist in wildland fire suppression and structural protection from wildland fire within the park.

#### **OZARK AGREES TO:**

A. Provide initial fire extinguisher response to all structural fires and vehicle fires on OZARK lands.

**B. Cooperate and coordinate with TIMBER command personnel in facilitating TIMBER's suppression of structural fires on OZARK lands.**

**C. Allow TIMBER to use OZARK hydrants and water resources for fighting fires.**

**FOR WILDLAND FIRES OUTSIDE THE PARK:**

**OZARK agrees to respond with qualified personnel and with equipment to any wildfire outside the park, but within the geographical area, at the request of the Missouri Department of Conservation. OZARK response will be in accordance with federal wildland fire policies and procedures.**

**OZARK AND TIMBER MUTUALLY AGREE TO THE FOLLOWING:**

**A. Employee/volunteers of TIMBER are not considered employees of OZARK.**

**B. TIMBER specifically waives reimbursement for any cost incurred in fighting fires in the park, pursuant to this agreement.**

**C. The obligations of OZARK under this agreement are contingent upon the appropriation of funds created by Congress for this purpose.**

**D. OZARK and TIMBER waive all claims against each other for compensation for any loss, damage, personal injury or death occurring during activities under this agreement.**

**E. OZARK AND TIMBER agree to manage any structural fire within the park or other mutual aid incident under the Incident Command System (ICS).**

**F. OZARK AND TIMBER agree to cooperate on fire investigations, incident reporting, and the sharing of information on fires in the mutual aid area.**

**TERM OF THE AGREEMENT:**

**APPENDIX E**

**The term of this agreement is five (5) years, however either OZARK or TIMBER has the right to terminate this agreement with 30 days prior written notice to the other party to this agreement. OZARK and TIMBER will jointly review the results of the agreement at the end of each calendar year.**

**KEY OFFICIALS:**

**The Park Superintendent has the authority and responsibility for managing this agreement on behalf of OZARK, assisted by the Fire Management Officer (FMO).**

**The President of TIMBER, has the authority and responsibility for managing this agreement on behalf of the TIMBER community.**

**REQUIRED CLAUSES:**

**A. No member or delegate to Congress, or resident Commissioner, shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this**



agreement if made with a corporation for its general benefit.

B. During the performance of this agreement, the participants agree to abide by the terms of Executive Order 11246 on non-discrimination and will not discriminate against any person because of race, color, religion, sex, or national origin. The participants will take affirmative action to ensure that applicants are employed without regard to their race, color, religion, sex, or national origin.

Dated this \_\_\_\_11\_\_\_\_ day of \_March\_\_\_\_, 2002.

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Superintendent

Ozark National Scenic Riverways

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President

TIMBER Community Fire Protection District

## **APPENDIX E**

### **MEMORANDUM OF UNDERSTANDING**

**Between**

**NATIONAL PARK SERVICE**

**(OZARK NATIONAL SCENIC RIVERWAYS)**

**and**

**JADWIN RURAL FIRE DEPARTMENT**

The Memorandum of Understanding is entered into between the JADWIN RURAL FIRE DEPARTMENT, acting through and by the president and Chief of the Department, hereinafter referred to as JADWIN and the NATIONAL PARK SERVICE, acting through and by the Superintendent, Ozark National Scenic Riverways (OZAR), hereinafter referred to as Ozark.

**AUTHORITY**

The Act of May 27, 1955, at seq., 42 U.S.C. § 1856 (a) and 16 U.S.C. §§ 1b (1) and 1b (8) authorize agencies of the United States to enter into agreements with other fire protection organizations to render emergency fire fighting and mutual assistance in the suppression of fires.

**PURPOSE**

The purpose of this agreement is to establish the terms and conditions under which the NATIONAL PARK SERVICE, OZARK NATIONAL SCENIC RIVERWAYS, and the JADWIN RURAL FIRE DEPARTMENT will furnish supplies and materials and/or assistance to each other in suppressing structural fires and wildfires. The rural area surrounding the JADWIN community in Dent County, Missouri, and the federal properties and developments located in and around Akers Ferry, Pulltite, Cedargrove, and Baptist Landing will be benefited by the agreement.

Now THEREFORE, the parties to hereby agree as follows:

1. In the previous agreement, OZARK agreed to furnish one fire engine to JADWIN for their use in structural fire fighting in the JADWIN area of fire suppression responsibility, including OZAR. The engine included hose, fittings, and other fire fighting items. Following transfer of the loaned equipment, OZARK accepted no responsibility for the loaned equipment, nor warranted that the equipment supplied with the engine was satisfactory for accomplishment if the intended purpose. JADWIN was and is responsible for inspecting, performing repairs, and obtaining licensing of any equipment supplied by OZARK. That engine was provided by OZARK, and the agreement regarding it remains applicable.
2. In the event that JADWIN determines during the term of this agreement to discontinue use of the engine for any reason, or upon expiration of this agreement, the engine will be returned to OZARK in as good condition as when delivered, less normal wear and tear.
3. Should JADWIN decide not to use any of the equipment, or to replace it, the equipment will be returned to OZARK in as good condition as when delivered, less normal wear and tear.
4. JADWIN agrees to provide proper vehicle maintenance and servicing (lubrication and oil) for the fire engine, and keep it in a state of readiness. JADWIN agrees to repair any mechanical problems including replacement of worn and damaged parts at no cost to OZARK. JADWIN agrees to store the fire engine in an enclosed, heated structure.
5. JADWIN agrees to maintain and service the accompanying fittings and hoses, at no cost to OZARK.
6. JADWIN will permit OZARK or an agent of OZARK to inspect all equipment and gear once a year, or whenever a problem is reported with said equipment or gear. If the equipment inspected is found to be in abnormal disrepair, shows evidence of abuse and/or not being maintained to commonly accepted standards, OZARK shall remove the equipment from JADWIN until such time that the problem can be rectified to the satisfaction of both parties.

**APPENDIX E**

7. JADWIN agrees to maintain third party liability, comprehensive and collision insurance to protect National Park Service, OZARK, the engine, and equipment loaned to JADWIN for performance under this agreement. JADWIN will provide copies of insurance policies or certificates of insurance to OZARK. JADWIN also agrees to notify OZARK within 5 days of any change in insurance coverage including cancellation of policies.

8. OZARK assumes no responsibility for operation or maintenance of the property and equipment loaned to JADWIN. Further, neither the United States nor any of its employees will assume liability for any deficiencies in the operation, maintenance or performance of such equipment.

9. JADWIN shall be responsible for replacing or repairing the engine and other equipment that is destroyed, lost, or damaged beyond repair due to negligence or misuse.

#### **FIRES ON PARK ADMINISTERED LANDS:**

##### **JADWIN AGREES TO:**

A. Be the primary responder for all structural fires, vehicle fires, and vehicle accident extrications. OZARK will provide a representative to coordinate with JADWIN on all emergency services rendered on park lands.

B. Respond to and engage in the immediate containment and suppression of all structural fires in the park.

C. Respond to requests from OZARK to supply fire engines, water tenders/tankers, water and personnel and otherwise assist in wildland fire suppression and structural protection from wildland fire within the park.

##### **OZARK AGREES TO:**

A. Provide initial fire extinguisher response to all structural fires and vehicle fires on OZARK lands.

B. Cooperate and coordinate with JADWIN command personnel in facilitating JADWIN's suppression of structural fires on OZARK lands.

C. Allow JADWIN to use OZARK hydrants and water resources for fighting fires.

#### **FOR WILDLAND FIRES OUTSIDE THE PARK:**

OZARK agrees to respond with qualified personnel and with equipment to any wildfire outside the park, but within the geographical area, at the request of the Missouri Department of Conservation. OZARK response will be in accordance with federal wildland fire policies and procedures.

#### **OZARK AND JADWIN MUTUALLY AGREE TO THE FOLLOWING:**

A. Employee/volunteers of the JADWIN RURAL FIRE DEPARTMENT are not considered employees of OZARK.

B. JADWIN specifically waives reimbursement for any cost incurred in fighting fires in the park, pursuant to this agreement.

C. The obligations of OZARK under this agreement are contingent upon the appropriation of funds created by Congress for this purpose.

D. OZARK and JADWIN waive all claims against each other for compensation for any loss, damage, personal injury or death occurring during activities under this agreement.

E. OZARK AND JADWIN agree to manage any structural fire within the park or other mutual aid incident under the Incident Command System (ICS).

**F. OZARK AND JADWIN agree to cooperate on fire investigations, incident reporting, and the sharing of information on fires in the mutual aid area.**

**TERM OF THE AGREEMENT:**

**APPENDIX E**

**The term of this agreement is five (5) years. OZARK and JADWIN will jointly review the results of the agreement at the end of each calendar year.**

**KEY OFFICIALS:**

**The Park Superintendent has the authority and responsibility for managing this agreement on behalf of OZARK, assisted by the Fire Management Officer (FMO).**

**The Fire Chief, JADWIN RURAL FIRE DEPARTMENT, has the authority and responsibility for managing this agreement on behalf of the JADWIN community.**

**REQUIRED CLAUSES:**

**A. No member or delegate to Congress, or resident Commissioner, shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.**

**B. During the performance of this agreement, the participants agree to abide by the terms of Executive Order 11246 on non-discrimination and will not discriminate against any person because of race, color, religion, sex, or national origin. The participants will take affirmative action to ensure that applicants are employed without regard to their race, color, religion, sex, or national origin.**

**Dated this \_\_\_\_\_ day of \_\_\_\_\_, 2002.**

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**Superintendent**

**Ozark National Scenic Riverways**

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**Board President**

**Jadwin Rural Fire Department**

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**Fire Chief**

**Jadwin Rural Fire Department**

**APPENDIX E**

**MEMORANDUM OF UNDERSTANDING**

**Between**

**NATIONAL PARK SERVICE**

**(OZARK NATIONAL SCENIC RIVERWAYS)**

**and**

**EMINENCE AREA FIRE DEPARTMENT**

The Memorandum of Understanding is entered into between the EMINENCE AREA FIRE DEPARTMENT, acting through and by the president and Chief of the Department, hereinafter referred to as EMINENCE and the NATIONAL PARK SERVICE, acting through and by the Superintendent, Ozark National Scenic Riverways (OZAR), hereinafter referred to as Ozark.

**AUTHORITY**

The Act of May 27, 1955, at seq., 42 U.S.C. § 1856 (a) and 16 U.S.C. §§ 1b (1) and 1b (8) authorize agencies of the United States to enter into agreements with other fire protection organizations to render emergency fire fighting and mutual assistance in the suppression of fires.

## **PURPOSE**

The purpose of this agreement is to establish the terms and conditions under which the NATIONAL PARK SERVICE, OZARK NATIONAL SCENIC RIVERWAYS, and the EMINENCE AREA FIRE DEPARTMENT will furnish supplies and materials and/or assistance to each other in suppressing structural fires and wildfires. The rural area surrounding the Eminence community in Shannon County, Missouri, and the federal properties and developments located in and around Alley Springs, Round Springs and Two Rivers within the boundaries of the Ozark National Scenic Riverways (OZAR) will be benefited by the agreement.

Now THEREFORE, the parties to hereby agree as follows:

1. OZARK agrees to furnish one fire engine to EMINENCE for their use in structural fire fighting in the EMINENCE area of fire suppression responsibility, including OZAR. The engine included hose, fittings, and other fire fighting items. Following transfer of the loaned equipment, OZARK accepted no responsibility for the loaned equipment, nor warranted that the equipment supplied with the engine was satisfactory for accomplishment if the intended purpose. EMINENCE is responsible for inspecting, performing repairs, and obtaining licensing of any equipment supplied by OZARK.
2. In the event that EMINENCE determines during the term of this agreement to discontinue use of the engine for any reason, or upon expiration of this agreement, the engine will be returned to OZARK in as good condition as when delivered, less normal wear and tear.
3. Should EMINENCE decide not to use any of the equipment, or to replace it, the equipment will be returned to OZARK in as good condition as when delivered, less normal wear and tear.
4. EMINENCE agrees to provide proper vehicle maintenance and servicing (lubrication and oil) for the fire engine, and keep it in a state of readiness. EMINENCE agrees to repair any mechanical problems including replacement of worn and damaged parts at no cost to OZARK. EMINENCE agrees to store the fire engine in an enclosed, heated structure.
5. EMINENCE agrees to maintain and service the accompanying fittings and hoses, at no cost to OZARK.
6. EMINENCE will permit OZARK or an agent of OZARK to inspect all equipment and gear once a year, or whenever a problem is reported with said equipment or gear. If the equipment inspected is found to be in abnormal disrepair, shows evidence of abuse and/or not being maintained to commonly accepted standards, OZARK shall remove the equipment from EMINENCE until such time that the problem can be rectified to the satisfaction of both parties.
7. EMINENCE agrees to maintain third party liability, comprehensive and collision insurance to protect National Park Service, OZARK, the engine, and equipment loaned to EMINENCE for performance

## **APPENDIX E**

under this agreement. EMINENCE will provide copies of insurance policies or certificates of insurance to OZARK. EMINENCE also agrees to notify OZARK within 5 days of any change in insurance coverage including cancellation of policies.

8. OZARK assumes no responsibility for operation or maintenance of the property and equipment loaned to EMINENCE. Further, neither the United States nor any of its employees will assume liability for any deficiencies in the operation, maintenance or performance of such equipment.
9. EMINENCE shall be responsible for replacing or repairing the engine and other equipment that is destroyed, lost,

or damaged beyond repair due to negligence or misuse.

#### **FIRES ON PARK ADMINISTERED LANDS:**

##### **EMINENCE AGREES TO:**

- A. Be the primary responder for all structural fires, vehicle fires, and vehicle accident extrications. OZARK will provide a representative to coordinate with EMINENCE on all emergency services rendered on park lands.**
- B. Respond to and engage in the immediate containment and suppression of all structural fires in the park.**
- C. Respond to requests from OZARK to supply fire engines, water tenders/tankers, water and personnel and otherwise assist in wildland fire suppression and structural protection from wildland fire within the park. Park request will be made through the Missouri Department of Conservation, Eminence Forestry District.**

##### **OZARK AGREES TO:**

- A. Provide initial fire extinguisher response to all structural fires and vehicle fires on OZARK lands.**
- B. Cooperate and coordinate with EMINENCE command personnel in facilitating EMINENCE's suppression of structural fires on OZARK lands.**
- C. Allow EMINENCE to use OZARK hydrants and water resources for fighting fires.**

#### **FOR WILDLAND FIRES OUTSIDE THE PARK:**

**OZARK agrees to respond with qualified personnel and with equipment to any wildfire outside the park, but within the geographical area, at the request of the Missouri Department of Conservation, Eminence Forestry District. OZARK response will be in accordance with federal wildland fire policies and procedures.**

##### **OZARK AND EMINENCE MUTUALLY AGREE TO THE FOLLOWING:**

- A. Employee/volunteers of the EMINENCE AREA FIRE DEPARTMENT are not considered employees of OZARK.**
- B. EMINENCE specifically waives reimbursement for any cost incurred in fighting fires in the park, pursuant to this agreement.**
- C. The obligations of OZARK under this agreement are contingent upon the appropriation of funds created by Congress for this purpose.**
- D. OZARK and EMINENCE waive all claims against each other for compensation for any loss, damage, personal injury or death occurring during activities under this agreement.**
- E. OZARK and EMINENCE agree to manage any structural fire within the park or other mutual aid incident under the Incident Command System (ICS).**
- F. OZARK and EMINENCE agree to cooperate on fire investigations, incident reporting, and the sharing of information on fires in the mutual aid area.**

##### **TERM OF THE AGREEMENT:**

#### **APPENDIX E**

The term of this agreement is five (5) years. OZARK and EMINENCE will jointly review the results of the agreement at the end of each calendar year.

**KEY OFFICIALS:**

The Park Superintendent has the authority and responsibility for managing this agreement on behalf of OZARK, assisted by the Fire Management Officer (FMO).

The Fire Chief, EMINENCE AREA FIRE DEPARTMENT, has the authority and responsibility for managing this agreement on behalf of the EMINENCE.

**REQUIRED CLAUSES:**

- A. No member or delegate to Congress, or resident Commissioner, shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.
- B. During the performance of this agreement, the participants agree to abide by the terms of Executive Order 11246 on non-discrimination and will not discriminate against any person because of race, color, religion, sex, or national origin. The participants will take affirmative action to ensure that applicants are employed without regard to their race, color, religion, sex, or national origin.

Dated this   20   day of  June , 2001

\_\_\_\_\_  
Superintendent  
  
Ozark National Scenic Riverways



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**President**

**Eminence Area Fire Department**

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**Fire Chief**

**Eminence Area Fire Department**

**APPENDIX E**

**MEMORANDUM OF UNDERSTANDING**

**Between**

**NATIONAL PARK SERVICE**

**(OZARK NATIONAL SCENIC RIVERWAYS)**

**and**

**LITTLE BLACK/GRANDIN VFD**

The Memorandum of Understanding is entered into between the LITTLE BLACK/GRANDIN VFD, acting through and by the Chairman of the Board hereinafter referred to as LBVFD and the NATIONAL PARK SERVICE, acting through and by the Superintendent, Ozark National Scenic Riverways (OZAR), hereinafter referred to as the Ozark.

**AUTHORITY**

The Act of May 27, 1955, at seq., 42 U.S.C. § 1856 (a) and 16 U.S.C. §§ 1b (1) and 1b (8) authorize agencies of the United States to enter into agreements with other fire protection organizations to render emergency fire fighting and mutual assistance in the suppression of fires.

**PURPOSE**

The purpose of this agreement is to establish the terms and conditions under which the NATIONAL PARK SERVICE, OZARK NATIONAL SCENIC RIVERWAYS, and the LITTLE BLACK/GRANDIN VFD will furnish supplies and materials and/or assistance to each other in suppressing wildfires. The rural area surrounding the Grandin community in Carter County, Missouri, and the federal properties and developments located in and around Hickory Landing and the surrounding areas within the boundaries of the Ozark National Scenic Riverways (OZAR) will be benefited by the agreement.

Now THEREFORE, the parties to hereby agree as follows:

1. OZARK agrees to furnish one wildland fire brush truck to LBVFD for their use in wildland fire fighting in the GRANDIN area of fire suppression responsibility, including OZARK. The truck includes hose, fittings, and other fire fighting items. Following transfer of the loaned equipment, OZARK accepts no responsibility for the loaned equipment, nor warrants that the equipment supplied with the engine was satisfactory for accomplishment if the intended purpose. LBVFD is responsible for inspecting, performing repairs, and obtaining certification (licensing) of any equipment supplied by OZARK.
2. In the event that LBVFD determines during the term of this agreement to discontinue use of the engine for any reason, or upon expiration of this agreement, the engine will be returned to OZARK in as good condition as when delivered, less normal wear and tear.
3. Should LBVFD decide not to use any of the equipment, or to replace it, the equipment will be returned to OZARK in as good condition as when delivered, less normal wear and tear.
4. LBVFD agrees to provide proper vehicle maintenance and servicing (lubrication and oil) for the brush truck, and keep it in a state of readiness. LBVFD agrees to repair any mechanical problems including replacement of worn and damaged parts at no cost to OZARK. LBVFD agrees to maintain the slide in pumper unit to ensure its performance.
5. LBVFD agrees to maintain and service the accompanying fittings and hoses, at no cost to OZARK.
6. LBVFD will permit OZARK or an agent of OZARK to inspect all equipment and gear once a year, or whenever a problem is reported with said equipment or gear. If the equipment inspected is found to be in abnormal disrepair, shows evidence of abuse and/or not being maintained to commonly accepted standards, OZARK shall remove the equipment from LBVFD until such time that the problem can be rectified to the satisfaction of both parties.
7. LBVFD agrees to maintain third party liability, comprehensive and collision insurance to protect National Park Service, OZARK, the truck, and equipment loaned to LBVFD for performance under this agreement. LBVFD will provide copies of insurance policies or certificates of insurance to

## **APPENDIX E**

OZARK. LBVFD also agrees to notify OZARK within 5 days of any change in insurance coverage including cancellation of policies.

8. OZARK assumes no responsibility for operation or maintenance of the property and equipment loaned to LBVFD. Further, neither the United States nor any of its employees will assume liability for any deficiencies in the operation, maintenance or performance of such equipment.
9. LBVFD shall be responsible for replacing or repairing the truck and other equipment that is destroyed, lost, or damaged beyond repair due to negligence or misuse.

### **FIRES ON PARK ADMINISTERED LANDS:**

#### **LBVFD AGREES TO:**

- A. Be the primary responder for all wildland fires, and vehicle fires. OZARK will provide a representative to coordinate with LBVFD on all emergency services rendered on park lands.
- B. Respond to and engage in the immediate containment and suppression of all wildland fires in the shared/bordering lands.
- C. Respond to requests from OZARK to supply fire engines, water tenders/tankers, water and personnel and otherwise assist in wildland fire suppression and structural protection from wildland fire within the park. Park

request will be made through the Missouri Department of Conservation.

**OZARK AGREES TO:**

A. Cooperate and coordinate with LBVFD command personnel in facilitating LBVFD's suppression of wildland fires on OZARK lands.

B. Allow LBVFD to use OZARK hydrants and water resources for fighting fires.

**OZARK AND LBVFD MUTUALLY AGREE TO:**

A. Employee/volunteers of the LBVFD are not considered employees of OZARK.

B. OZARK and LBVFD waive all claims against each other for compensation for any loss, damage, personal injury or death occurring during activities under this agreement.

C. OZARK and LBVFD agree to cooperate on fire investigations, incident reporting, and the sharing of information on fires in the mutual aid area.

**TERM OF THE AGREEMENT:**

The term of this agreement is five (5) years. OZARK and LBVFD will jointly review the results of the agreement at the end of each calendar year.

**KEY OFFICIALS:**

The Park/Riverways Superintendent has the authority and responsibility for managing this agreement on behalf of OZARK.

The Fire Chief, Little Black Volunteer Fire Department, has the authority and responsibility for managing this agreement on behalf of the LBVFD.

Dated this \_\_\_5\_\_\_ day of \_\_October\_\_, 2001

**APPENDIX E**

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Superintendent

Ozark National Scenic Riverways

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**Fire Chief**

**Little Black Volunteer Fire Department**

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**Chairman of the Board**

**Little Black Volunteer Fire Department**

**APPENDIX E**

**Memorandum Of Understanding**

**Between**

**United States Department of Interior**

**National Park Service**

**Ozark National Scenic Riverways**

**and**

**The Nature Conservancy**

**Missouri Ozarks Office**

**This agreement is made and entered into pursuant to the provisions to Section 5 (a) of the Act of August 27, 1964, 16 USC sect. 460m-4, which authorizes the formation of agreements between Federal, State and other organizations for the purpose of developing programs for "preservation and enhancement of the natural beauty of the landscape, and for the conservation of outdoor resources in the watersheds of the Current and Jacks Fork Rivers**

**This Agreement is entered into between the United States Department of Interior, National Park Service, Ozark National Scenic Riverways, hereinafter referred to as the "Park" and The Nature Conservancy, hereinafter referred to as the "Conservancy."**

**WITNESSETH:**

**Now, therefore, in consideration of the mutual promises set out below, the parties agree that;**

**WHEREAS, the Conservancy's mission is to preserve plants, animals and natural communities that represent the diversity**

of life on earth by protecting the lands and water they need to survive; and

WHEREAS, the Conservancy owns and manages the largest private system of natural sanctuaries in the world, of which some 7,100 acres borders Ozark National Scenic Riverways, and

WHEREAS, the Park manages over 65,000 acres in the Ozark National Scenic Riverways, which contains a diverse array of plants, animals and natural communities; and

WHEREAS, proper management of many Conservancy and Park lands requires the use of management ignited prescribed fire over large areas and across both parties boundaries; and

WHEREAS, the Conservancy and the Park have expertise in prescribed fire and fire management; and

WHEREAS, the Conservancy and the Park currently employ or have under contract personnel and equipment capable of performing prescribed fire; and

WHEREAS, it will be of mutual benefit for both parties to combine personnel and equipment on certain management ignited prescribed burn projects.

NOW, THEREFORE, in consideration of the above premises, the parties hereto agree as follows:

1. Personnel and equipment shall be provided by the Park to the Conservancy, or the Conservancy to the Park, as requested. Release of personnel and equipment to the other party shall be at the discretion of the Park Fire Management Officer or Conservancy Reserve Manager depending on the others workload, priorities and fire danger. Personnel and equipment may be used for:

a. Technical assistance including preparation or review of fire management plan and prescribed burn plans.

## APPENDIX E

b. Preburn preparation including vegetation and fuel load sampling, control line construction and maintenance, environmental monitoring and fuels manipulation.

c. Burn implementation including project supervision, ignition, holding, fire behavior and weather monitoring, and mop-up.

d. Post burn fire effects monitoring, evaluation, data management and storage.

2. The party requesting assistance to burn on that party's land shall provide the staff to perform as the prescribed burn boss and shall be responsible to produce the prescribed burn plan. In the event that each Party's land will be burned in one prescribed burn, then the prescribed burn boss shall be provided, and the prescribed burn plan completed, by mutual agreement of both the Conservancy and the Park. The assisting party will be given an opportunity to assist in the development of the individual prescribed burn plans, or review and provide comments to the administering party. The prescribed burn plan will clearly State the individuals to be assigned responsibilities of prescribed burn boss, ignition specialist, holding specialist, and fire behavior and weather specialist. Contingency planning in the event of an escaped fire will be an essential element of each plan.

3. A Chief of Party will be designated for the assisting party's personnel and equipment. The Chief of Party will work closely with the host park's prescribed burn boss. If the Chief of Party determines that the proposed burn is unsafe or has serious concerns about the advisability of burning, and is unable to reach a satisfactory agreement with the burn boss to rectify the situation, he or she retains the option of

withdrawing ~ assisting party's personnel and equipment.

4. Each party will provide for the salary and cost of its own personnel and the operation and maintenance of its own equipment.

5. Each party shall honor the prescribed fire qualification standards of the cooperating party for that party's employees. Park employees will adhere to National Wildfire Coordinating Group (NWCG) standards; Conservancy employees will adhere to Chapter 2.3.2 of the Fire Management Manual of The Nature Conservancy.

6. All aircraft and pilots used to transport Park personnel or directly controlled by the Park shall be certified by the Office of Aircraft Services prior to use.

7. Each of the parties waive all claims against the other party for compensation for any loss, damage, personal injury or death occurring in the consequence of the performance of this Agreement.

8. It is understood that employees of the Federal Government assisting in prescribed burns on Conservancy lands are to be considered as employees of the Federal Government and not of The Nature Conservancy.

9. It is understood that for purposes of the Conservancy's workers compensation coverage, employees of the Conservancy assisting in prescribed burns on Federal Lands are considered as employees of The Nature Conservancy and not the Federal Government.

10. Nothing herein contained shall be construed as binding the Park to expend in any one fiscal year any sum in excess of appropriations made by Congress or administratively allocated for the purpose of this Agreement for that fiscal year, or to involve the Park in any contact or other obligation for the further expenditure of money in excess of such appropriations or allocations.

## **REQUIRED CLAUSES**

## **APPENDIX E**

**Nondiscrimination:** All activities pursuant to this Agreement shall be in compliance with the requirements of the Executive Order 11246, as amended; Title VI of the Civil Rights Act of 1964 (78 Stat. 252: U.S.C. 2000d et seq.) and with all other federal laws and regulations prohibiting discrimination on the grounds of race, color, national origin, handicapped, religion, or sex in employment and in providing facilities and services to the people.

**Official not to benefit:** No member of or delegate to Congress, or resident commissioner shall be admitted to any share or part of this Agreement, or to any benefit that may arise therefrom.

## **ENACTMENT AND DURATION**

This Agreement will be effective on January 1, 1998 and will continue in effect for a period of five years. The Agreement will be reviewed annually, beginning January 1, 1999, and may be amended as needed. The Agreement may be terminated by either party thirty days following written notification to the other party .

**IN WITNESS WHEREOF,** the said parties hereunto subscribe their names.

**Ozark National Scenic Riverways The Nature Conservancy**

**Superintendent Lower Ozarks Project Director**

**12/2/1997 12/14/1997**

**Date Date**

**Missouri State Director**

**12/14/1997**

**Date**

**APPENDIX E**

**MEMORANDUM OF UNDERSTANDING**

**BETWEEN**

**UNITED STATES DEPARTMENT OF INTERIOR**

**NATIONAL PARK SERVICE**

**OZARK NATIONAL SCENIC RIVERWAYS**

**AND**

**STATE OF MISSOURI**

**DEPARTMENT OF CONSERVATION**

**This agreement is made and entered into pursuant to the provision of Act of May 27 , 1955, 42 U.S.C. 1856a, and Act of August 8, 1953, 16 U.S.C. 1b, as amended, and the Missouri Constitution, Article IV , Section 40a, between the United**

**States Department of Interior, National Park Service, Missouri National Park, Ozark National Scenic Riverways, called Park and the State of Missouri, Department of Conservation, hereinafter called State.**

**Witnesseth:**

**Whereas, it is understood that a Reciprocal Fire Protection agreement between the Park and the State will be beneficial to both agencies and for the protection of public and private lands;**

**Now, therefore, in consideration of the mutual promises set out below, the parties agree that;**

**This agreement shall become effective when signed by both parties and will run for a term of five ( 5) years or until termination by either party upon thirty (30) days written notice to the other, except that this agreement shall not be terminated between February 15 and October 30 of any year without written consent of both parties. Upon mutual consent the agreement may be reaffirmed upon expiration. Representatives for each agency will meet at least one time per year to exchange updated information on personnel and equipment and discuss previous year's fire operations and review the terms of this agreement.**

### **State Responsibilities**

#### **Detection**

- 1. Upon discovery, the State will immediately notify the Park of any wildfires occurring inside or adjacent (within 1/2 mile) of the Park boundary, and will advise the Park of any planned ignition on State lands within 1/2 mile of the Park.**
- 2. State aircraft, either State-owned or contract, during flights scheduled to meet State detection needs, will serve as primary detection for both State and Park lands.**
- 3. If the Park requests detection flights other than normally scheduled State flights, such flights will be reimbursed by the Park at contract rates in effect at the time. Approval for extra detection flights will be subject to availability of the pilot and aircraft.**
- 4. The State will provide the Park with current procedures for contacting their personnel during on and off-duty hours.**

#### **Suppression**

- 1. Upon occurrence of a wildfire outside the Park boundary and threatening Park lands, the State will promptly proceed to take all reasonable action to control and suppress the fire.**

### **APPENDIX E**

- 2. The State agrees to assist the Park upon request by furnishing personnel and equipment to fight fires within the boundaries of the Park, subject to personnel and equipment availability.**
- 3. The State agrees to immediately notify the Park of any wildfire that occurs on State or private lands within the Park boundary. This notification will include an assessment of any threat to Park boundary, legal location, fire spread, fire behavior characteristics, and personnel and equipment that are responding to the fire.**

#### **Reports**

- 1. For a wildfire within the Park's boundary, both agencies will complete agency-required reports. For wildfires on**



State lands within the Park boundary, the State will report as a Statistical fire and the Park non-statistical. The Park will make the Statistical Fire Report for all wildfires that occur on private lands or acquisition deferred lands.

2. The Park agrees to provide the State with maps and descriptions of ecological (T & E species habitat) and cultural/historical sensitive areas when such maps become available.

### **Park Responsibilities**

#### **Detection**

1. The Park will notify- the State of any planned ignitions, and upon discovery, will immediately notify the State of any wildfires occurring adjacent (within 1/2 mile) to the Park boundary.

2. The Park will provide the State with current procedures for contacting personnel during on and off-duty time. During periods of VERY HIGH or EXTREME fire danger, the Park will inform the State of personnel on fire duty, their schedule and location.

#### **Suppression**

1. The Park will be responsible for all wildfires occurring within the Park boundary, except for wildfires on lands owned by the State.

2. Upon occurrence of a wildfire inside the Park boundary and threatening any lands outside its boundary, the Park will promptly proceed to take an reasonable action to control and suppress the fire.

3. The Park agrees to assist the State upon request by furnishing locally available qualified personnel and equipment to fight wildfires beyond the Park boundary.

### **Mutual Aid Responsibilities**

#### **Fire Prevention**

Each agency is responsible for fire prevention activities in its respective area. However, where possible, both agencies will cooperate with one another in this area. Both agencies agree to cooperate and share information about arson fire outbreaks and possible suspects for arson fires which may affect the lands of both agencies.

#### **Suppression**

1. Both agencies will take initial action and assist the other on wildfires outside its protection area, at the request of the other agency, provided that such action will not seriously jeopardize its primary responsibility. Both agencies agree to make initial attack on any wildfire that they come upon on the

### **APPENDIX E**

other's land, and aggressively fight the fire until the other agency's personnel and equipment arrive and relieve them

2. As the Park was established by Congress to protect outstanding natural and cultural resources, fire suppression activities by either party on fires within the Park, except on State or privately owned lands, should conform to the NPS policy of "minimum impact fire suppression". Heavy mechanized equipment (tractors. tractor plows) will be approved by the Park Superintendent or the Park Fire Management Officer, on a case-by-case basis. Where extreme fire behavior is observed and there is an immediate threat of the wildfire to leave the Park, and/or there is an immediate threat to life and/or property and where neither of the above Park officials are available, the Incident Commander may make the decision to use mechanized equipment based upon his best judgment of the situation

and threat.

3. The agency taking initial action outside its protection area will retain control until a qualified Incident Commander of the responsible agency arrives. At this time, control and responsibility for the fire shall be turned over to the responsible agency.

4. On any mutual assistance fires, no cost shall be charged against the other agency for time and expense of its regular or seasonal employees, nor rental or maintenance of the lending agency's equipment.

5. No paid third party assistance will be called into a wildfire on the other lands without first clearing such action with the other agency. The only exception to this is if no representative of the other agency is available, the Incident Commander will use his best judgment and may take such action.

6. When a wildfire burns across agency boundary, the agency into which area it burns will assume control as soon as practical and will be responsible for the suppression of the fire. Both agencies will operate under the Incident Command System. with a joint, unified command, working together to suppress the fire on both agencies' lands. Each agency will pay their own suppression cost. If such a wildfire results from the loss of control of a planned ignition on State or Park land, the responsible agency for the escape fire may be billed by the other agency for suppression cost.

7. Communication by telephone and/or radio will be maintained between agencies.

#### **Prescribed Fire Assistance**

Mutual assistance may be provided in terms of equipment and personnel upon request, and as available, for prescribed burning on public lands. Such assistance will not be billed against the other agency. Every attempt will be made to keep such assistance to normally assigned duty hours. On planned ignitions where both agencies' lands are within the planned ignition area, the Burn Boss position will be shared under a unified command structure.

#### **Disputes**

Any disputes which cannot be reconciled between the parties shall promptly be referred through channels to the State Forester and Park Superintendent for resolution.

#### **Convict Labor**

In connection with the performance of work under this agreement the State agrees not to employ any person undergoing sentence of imprisonment except as provided by 18 U.S.C. 4082(c) (1970) and Executive Order 11755, December 29, 1973 (attached).

#### **Liability**

### **APPENDIX E**

Each party waives an claims against the other for any loss, damage, personal injury , or death occurring in consequence of the performance of this agreement. Repairs necessary to keep in operation any of the equipment covered by this agreement during the course of use will be made by and at the expense of the party owning the equipment.

#### **Nondiscrimination**

All activities pursuant to this Agreement shall be in compliance with the requirements of Executive Order 11246, as amended; Title VI of the Civil Rights Act of 1964 {78 Stat. 252: 42 U.S.C. 2000d et seq.}; and with all other federal laws and regulations prohibiting discrimination on the grounds of race, color, national origin, handicapped, religion, or sex in employment and in providing facilities and services to the public.

## **Officials Not to Benefit**

**No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom.**

**In witness whereof, the parties hereto have executed this agreement the date and year last signed below.**

**Director Date 9/2/97**

**Missouri Department of Conservation**

**State of Missouri**

**Superintendent Date 8/18/97**

**Ozark National Scenic Riverways**

**National Park Service**

## **APPENDIX E**

### **MISSOURI & IOWA INTERAGENCY COORDINATION CENTER**

#### **ADVISORY BOARD CHARTER**

**The Missouri & Iowa Interagency Coordination Center Advisory Board is established to provide an interagency approach to incident dispatch in Missouri or Iowa, to provide direction to the Center Manager and to oversee the operations of the Missouri & Iowa Interagency Coordination Center .**

**The Board will be composed of Fire Management Officers or his/her designee from each of the following agencies, whose units will be dispatched by the Missouri & Iowa Interagency Coordination Center:**

**One Member- Mark Twain National Forest,**

**One Member -National Park Service,**

**One Member -U.S. Fish and Wildlife Service,**

**One Member -Missouri Department of Conservation,**

**One Member- Iowa Department of Natural Resources (Division of Forestry)**

The chairperson of the Board shall be rotated among the representatives in the sequence listed above serving two-year terms. Beginning January J, 2001, the Mark Twain National Forest Representative will serve through December 31, 2002.

The chairperson is responsible for calling the meeting, setting the agenda, facilitating the meeting and follow-up action items. For the purpose of continuity, a recorder will be provided by the Missouri & Iowa Interagency Coordination Center. The recorder will also be responsible for the distribution of meeting notes taken.

The Missouri & Iowa Interagency Coordination Center Manager or his/her designee will serve as a member and as technical advisor to the Board.

#### **Purpose and Duties:**

Agency representatives will be responsible to ensure respective agency policy and procedures are maintained and agency administrators are kept informed. The Board will have full authority to implement operational changes, which do not include policy changes. Policy recommendations, which require changes, modifications or costs, will be reviewed and approved by agency administrators before implementations.

The Board will coordinate recommendations for agency acceptance and implementation and:

- I. Provides leadership and a coordinated direction for wildland fire dispatching in Missouri & Iowa.
2. Provide a forum for the exchange of ideas and the development of consistent policies for wildland fire dispatching.
3. Foster cooperation, avoid wasteful duplication and facilitate maximum efficiency of wildland fire dispatching processes through coordinated planning and utilization of closest forces and shared resources concepts.
4. Establish and maintain an interagency approach to wildland fire management programs through the development of a full interagency association and facilitate a high degree of professionalism, trust and mutual assistance among wildland fire management agencies.
5. Establish and maintain an interagency approach to wildland fire training.
6. Identify issues, establish priorities, develop alternatives and recommend a unified course of action for respective agency administrators.

The Board will perform certain specific functions, including:

## **APPENDIX E**

1. Serve as the local Multi-Agency Coordination Group (MAC Group) when activated in accord with the Missouri & Iowa Interagency Incident Mobilization Guide.
2. Provide for delegation of authority and direction to the Center Manager and provide administrative oversight of the Missouri Interagency Coordination Center.

#### **Meetings:**

The Board will meet once a year .More frequent meetings may be held if deemed necessary by a simple majority of the Board members. Meeting locations, dates and times will be established by the Chairperson with consensus of the group.

#### **Expenses:**

Expenses incurred by board members, salary, travel, per diem and operating expenses. Will be borne by the member's agency.

Agency Approval

Regional Director, U.S. Fish and Wildlife Service Date 10/5/01

Forest Supervisor, Mark Twain National Forest Date 12/2/01

Superintendent, Ozark National Scenic Riverways Date 8/16/01

State Forester, IDNR – Division of Forests and Prairies Date 11/26/01

State Forester, Missouri Department of Conservation Date 8/23/01

**APPENDIX E**

4. Sample Delegation of Authority

Ozark National Scenic Riverways

Van Buren, MO

Delegation of Authority

As of 1800, May 20, 2001, I have delegated authority to manage the North End 1 fire, number 0102, Ozark National Scenic Riverways, to Incident Commander, John Doe and his Incident Management Team.

The fire which originated as a lightning fire on May 18, 2001, is burning in habitat adjacent to the OZAR boundary. My considerations for management of this fire are:

1. Provide for firefighter safety.
2. I would like the fire managed in such a manner that suppression actions will cause little environmental damage as possible.
3. Key features requiring priority protection are: adjacent private lands, campground, and NPS infrastructure.
4. Key resource considerations are: protecting bluffs adjacent to the river.
5. Restrictions for suppression actions are no tracked vehicles in the area of the bluffs or river bottom will be utilized.

- 6. Minimum tools for use are Type II/III helicopters, and chainsaws.
- 7. My agency advisor will be park Acting Fire Management Officer, Angela Smith.
- 8. Managing the fire cost-effectively for the values at risk is a significant concern.
- 9. Providing training opportunities for OZAR personnel is requested to strengthen our organizational capabilities.

Superintendent, Ozark National Scenic Riverways

May 20, 2001

APPENDIX E

5. Key Contacts List

Table 11 – Key Contacts

Mark Twain Fire Management Officer	Randy Miller	573-341-7493
MO Department of Conservation District	Rich Blatz	573-223-4525
MO Department of Conservation District	Joe Garvey	573-290-5858 ext. 245
MO Department of Conservation District	Clint Dalbaum	573-226-3616
MO Department of Conservation Region	Tom Draper	417-256-7161
Mark Twain Zone 1 Rolla	Lyn Carpenter.	573-341-7486
Mark Twain Zone 2 Winona	Ben Wyatt	573-325-4233

APPENDIX F

F. Wildland and Prescribed Fire Monitoring Plan

This plan is a separate attachment due to its size.

## APPENDIX G

### G. Pre-Attack Plan

Table 12 – Pre-Attack Table

Function/Item	Available	Needed	Not Needed
<b>Command</b>			
Pre-attack WFSA			
Pre-positioning Needs			
Draft Delegation of Authority	X		
Management Constraints	X		
Interagency Agreements	X		
Evacuation Procedures			
Structural Protection Needs	X		
Closure Procedures	X		
<b>Operations</b>			
Water Sources	X		
Control Line Locations			
Natural Barriers	X		
Safety Zones			
Flight Routes/Restrictions			
Staging Area Locations	X		
Helispot/Helibase Locations			
<b>Logistics</b>			
ICP Location	X		
Roads/Trails with Limitations	X		

Utilities	X		
Medical Facilities	X		
Stores/Restaurants/Services	X		
Rental Equipment Sources			
Construction Contractors	X		
Sanitary Facilities			
Law Enforcement/Fire Departments	X		
Communications (availability)			
Maintenance Facilities			
Sanitary Landfills	X		
<b>Planning</b>			
Park Base Map	X		
Area Topographic Maps	X		
Infrared Imagery			
Vegetation/Fuel Maps	X		
Hazard Maps (ground and aerial)			
Special Visitor Use Areas			
Land Ownership Status			
Archeological/Cultural Resource Maps	X		
Sensitive Plant Area Maps			

## APPENDIX H

### H. Step-up Plan

Table 13 – Step-up Plan

Staffing Class	Fuel Model	Burning Index	Step up Actions
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SC-1	E	0-7	<p>Normal tours of duty are scheduled.</p> <p>Fire preparations during this stage will entail inventory and servicing of all fire equipment vehicles and supplies.</p> <p>The fire call-up roster, found in appendix e, will be confirmed and distributed to key employees.</p> <p>All qualified initial attack firefighters will be outfitted with personal protective equipment.</p> <p>One fire qualified employee will be available during duty hours in each park.</p>
SC-2	E	8-16	Same as SC-1.
SC-3	E	17-34	<p>Same as SC-2 plus</p> <p>All scheduled work duties and visitor activities will continue as normal, but fire packs and personal equipment for fire qualified employees will be kept near at hand in offices or vehicles.</p> <p>Effort will be made to schedule two fire qualified persons on duty in each park.</p> <p>Equipment and supplies for back-up crews are ready for immediate use and the park is totally prepared to respond to fires.</p> <p>During periods of high visitation (holidays, weekends) move to Staffing Class 4.</p>
SC-4	E	35-37	<p>Actions in SC-3 plus</p> <p>At this stage of fire danger, precautionary signs may be posted and/or fire prevention materials given to visitors.</p> <p>Park fire personnel may be notified they are on-call, and overtime (personnel may work days off) may be authorized to provide necessary patrols and presuppression needs.</p> <p>Additional patrols will be made in high fire occurrence areas of the park.</p> <p>The FMO will contact the Midwest regional FMO. If deemed necessary, extend coverage of initial attack personnel to 12 hour work days, using emergency preparedness funds for overtime incurred.</p> <p>Fire prevention efforts and messages will be coordinated with local USFS and DOC offices so the public will receive consistent information.</p> <p>During periods of high visitation (holidays,</p>

			weekends) move to Staffing Class 5.
SC-5	E	38+	<p><b>Actions in SC-4 plus</b></p> <p><b>Staffing Class 5 will require that a Type IV Incident Commander will be on duty (on-call after hours) through the critical burning period.</b></p> <p><b>The park's three primary fire caches will be staffed daily during the primary burning period.</b></p> <p><b>Contacts will be made with fire fighting units of adjacent agencies and the radio communication net between agencies will be monitored.</b></p> <p><b>Closures and restrictions will be coordinated with the Mark Twain National Forest and Missouri Department of Conservation.</b></p> <p><b>Open fires will be prohibited.</b></p> <p><b>Trailheads will be posted with fire danger warning signs.</b></p>

## APPENDIX I

### I. Long-Term Prescribed Fire and Hazard Reduction Plan

#### 1. Multi-year prescribed fire schedule

Table 14 – Prescribed Fire Schedule

Fiscal Year	Burn Unit Name	Park Acres	Total Acres	Cooperating Agency(s)
2005	Alley Glade	223	244	MDC Forest
2005	Booming Shoals II	589	590	MDC (MOFEP)
2005	Quarry	126	126	
2005	Denning Hollow	383	383	
2005	Peavine II/Sweezie Hollow	255	255	
Totals		1576	1598	
2006	Stegall Mt.	324	982	MDC
2006	Winding Stairs	224	470	MDC & TNC
2006	Russell Mt./Lower Thorny/Upper Thorny	654	667	

2006	Peavine Glade/Boundary Woods	100	100	
2006	Partney Bluffs and Woods (Partney 1 & 2)	85	85	
2006	Chilton South	466	466	
Totals		1853	2770	
2007	Vance/Barnett Mt.	388	1357	MDC
2007	Chilton	828	828	
2007	Little Booming Shoal	340	360	MDC Forest
2007	Brandewiede/West Thorny	230	236	MDC Forest
2007	Angel Ridge	468	468	
2007	Peavine II/Sweezie Hollow	255	255	
Totals		2509	3504	
2008	Mill Mountain	409	448	MDC
2008	Van Buren Hollow	656	656	
2008	Beaver Pond	169	169	
2008	Peavine Glade/Boundary Woods	100	100	
2008	Devil's Well	99	99	
2008	Denning Hollow	383	383	
2008	Horse Hollow/Pistol Barrel	114	114	
Totals		1930	1969	
2009	Winding Stairs	224	470	MDC & TNC
2009	Stegall Mt.	324	982	MDC
2009	Booming Shoals II	589	590	MDC (MOFEP)
2009	Brandewiede/West Thorny	230	236	MDC Forest
2009	Campbell Point/Quarry	475	475	

2009	Chilton South	466	466	
2009	Peavine II/Sweezie Hollow	255	255	
Totals		2563	3474	
2010	Mill Mountain	409	448	MDC
2010	Alley Glade	223	244	MDC Forest
2010	Chilton	828	828	
2010	Partney Bluffs and Woods (Partney 1 & 2)	85	85	
2010	Russell Mt./Lower Thorny/Upper Thorny	654	667	
Totals		2199	2272	
2011	Vance/Barnett Mt.	388	1357	MDC
2011	Little Booming Shoal	340	360	MDC Forest
2011	Peavine Glade/Boundary Woods	100	100	
2011	Angel Ridge	468	468	
2011	Van Buren Hollow	656	656	
2011	Devil's Well	99	99	
Totals		2051	3020	
2012	Denning Hollow	383	383	
2012	Peavine II/Sweezie Hollow	255	255	
2012	Horse Hollow/Pistol Barrel	114	114	
2012	Campbell Point/Beaver Pond	518	518	
2012	Chilton South	466	466	
Totals		1736	1736	
2013	Winding Stairs	224	470	MDC & TNC
2013	Chilton	828	828	

2013	Brandewiede/West Thorny	230	236	MDC Forest
2013	Russell Mt.	271	271	
Totals		1553	1805	
2014	Vance/Barnett Mt.	388	1357	MDC
2014	Mill Mountain	409	448	MDC
2014	Little Booming Shoal	340	360	MDC Forest
2014	Devil's Well	99	99	
2014	Campbell Point/Beaver Pond	518	518	
2014	Partney Bluffs and Woods (Partney 1 & 2)	85	85	
Totals		1839	2867	

## APPENDIX J

### J. Fire Prevention Plan

The existing Ozark National Scenic Riverways Fire Prevention Plan is out-dated. The Fire Prevention/Education Specialist will work with the Fire Management Officer and park staff to update the plan, and incorporate it into this document.

## APPENDIX K

### K. Rental Equipment Agreements

None currently in place.

## APPENDIX L

### L. Contracts for Suppression and Prescribed Fire Resources

None currently in place.

